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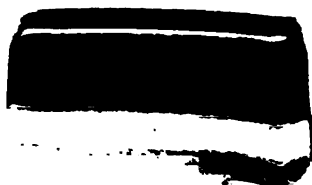
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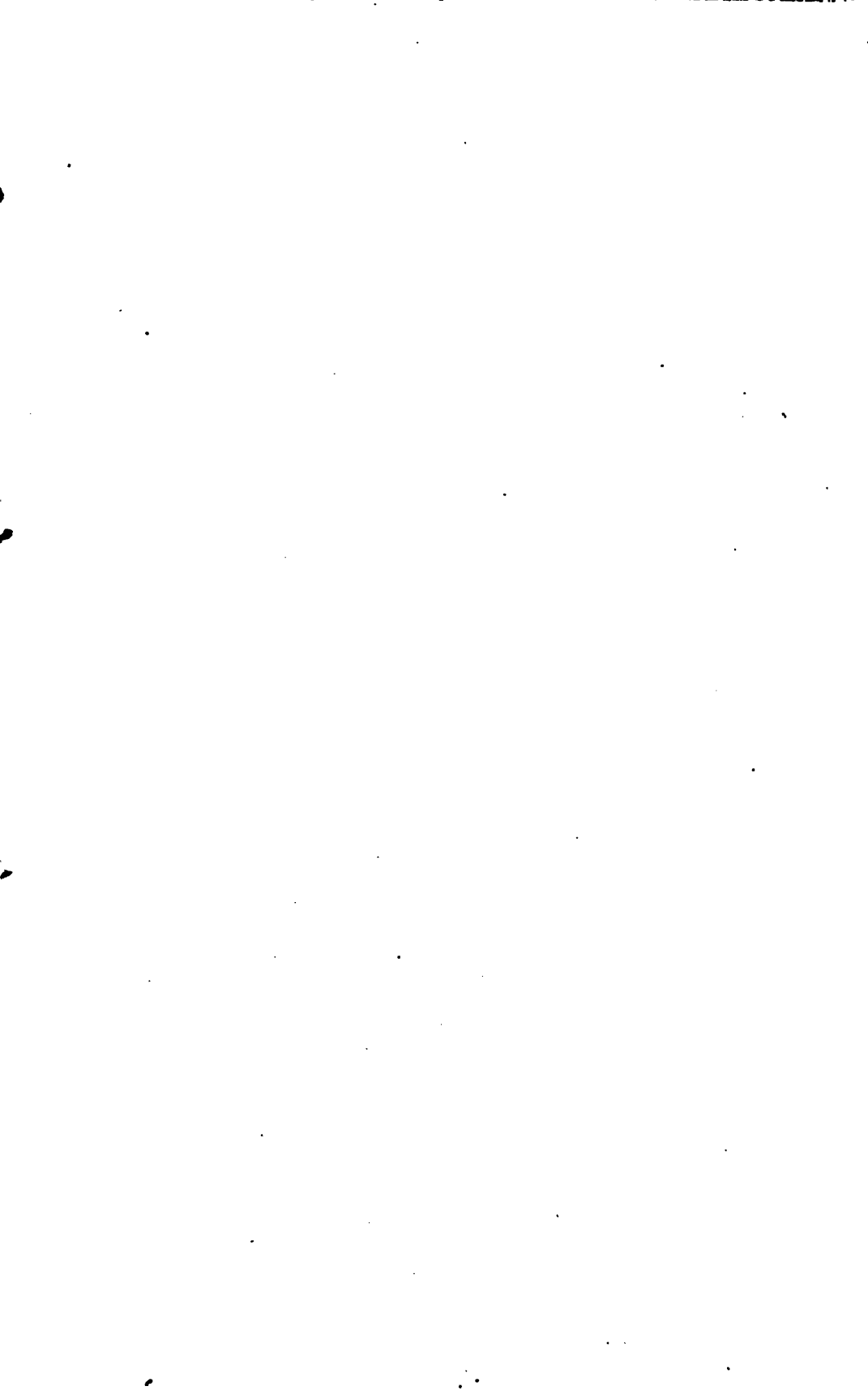
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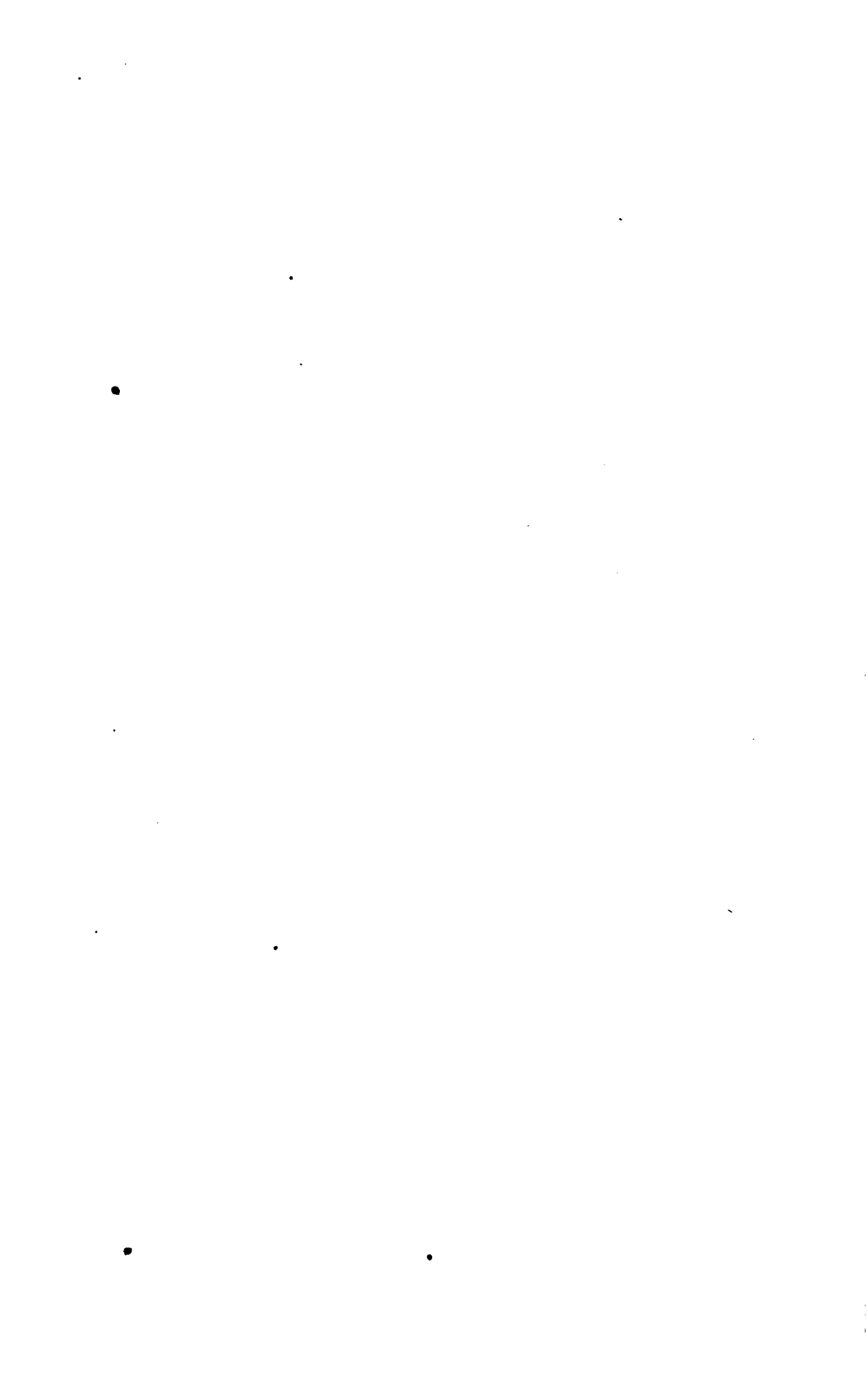
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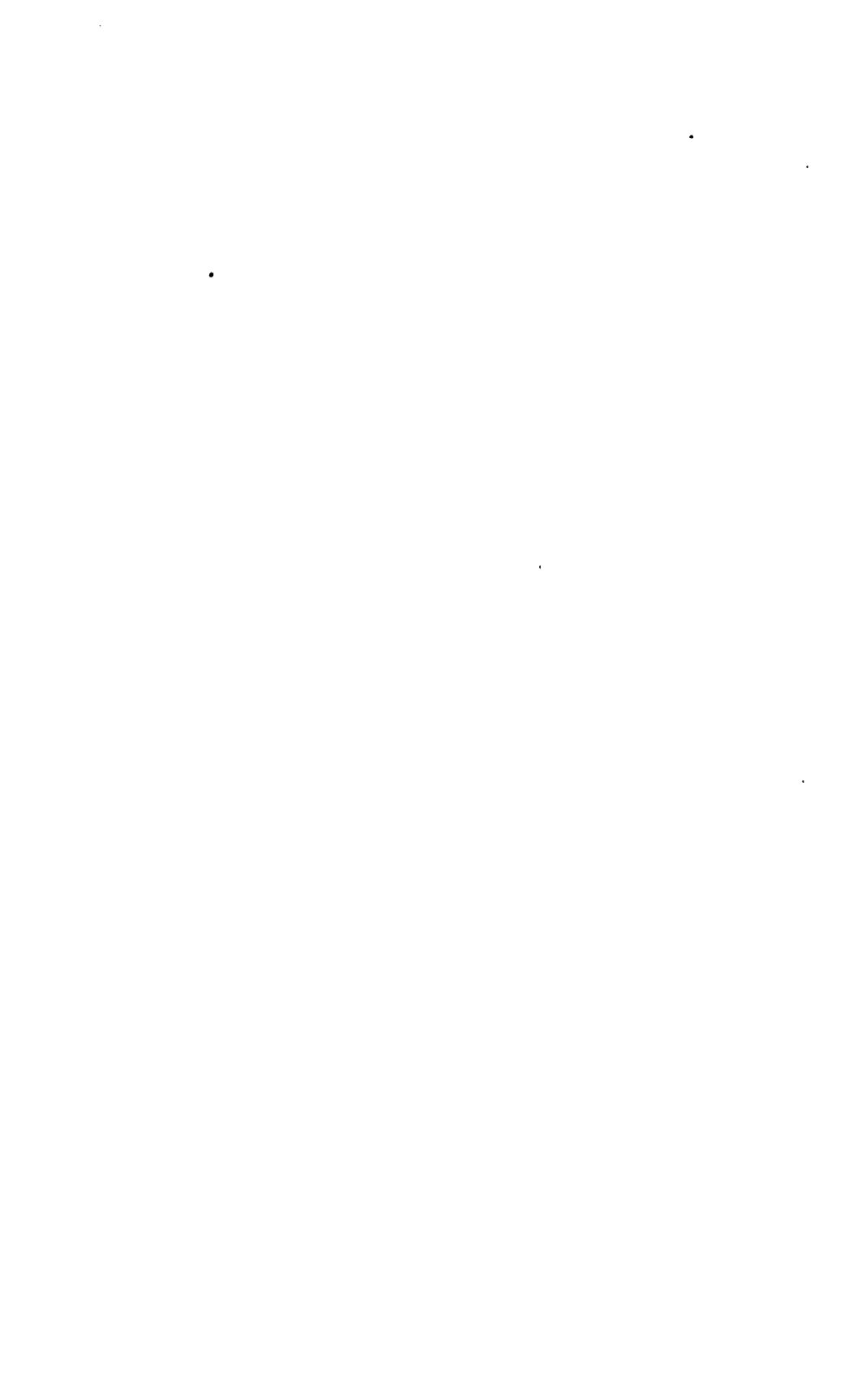
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THE
HUMAN INTELLECT:

WITH AN INTRODUCTION UPON

PSYCHOLOGY AND THE SOUL.

BY
NOAH PORTER, D. D.,
CLARK PROFESSOR OF MORAL PHILOSOPHY AND METAPHYSICS IN YALE COLLEGE.



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THIS VOLUME IS INSCRIBED.

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RESPECT AND AFFECTION

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P R E F A C E.

THE work now offered to the public was prepared primarily and directly as a text-book for colleges and higher schools. It was also designed secondarily, though not less really, as a manual for more advanced students of psychology and speculative philosophy. It was hoped, also, that it might find a place in the libraries of some of the many readers and thinkers who wish to form clear and well-grounded opinions in respect to the nature and limits of human knowledge, and to read with intelligence and satisfaction the history of philosophy.

The designs of the author in preparing the volume may serve in part to explain the selection and arrangement of the matter of which it consists, and to give greater force to a few suggestions in respect to its use as a text-book.

1. The more important definitions, propositions, and arguments are printed in the largest type, in distinct paragraphs, and the paragraphs are grouped, according to the principal topics, in separately numbered sections. The matter in this type is somewhat technically phrased and formally propounded, in order that it may be learned more readily for the examinations of the class-room. At the same time the aspect of too great technical formality has been studiously avoided by a free expansion, in somewhat varied phraseology, of the leading doctrines and definitions of the work. While the author has desired to avail himself fully of all the advantages which accrue from formal definitions and technical terms, he has not hesitated to repeat and illustrate his opinions in language somewhat popular in its character, and with a less rigid adherence to scholastic or precise terminology.

2. The matter which is properly explanatory and illustrative of the leading propositions is printed in smaller type. This occupies a large portion of the volume, and will be the most interesting to the student and the general reader. In this part of the work the author has used copious illustrations wherever they were needed to render clear what might otherwise have been obscure, concrete what might have been abstract, practical what was in danger of being scholastic, and familiar that which required to be repeated. Philosophical treatises and text-books fail very often of being perused with interest and profit for lack of concrete illustrations and varied and familiar applications; and against these defects the author has sought to guard this treatise. He has no fear that it will not be considered sufficiently abstruse and scientific. In preparing this part of the work he has sought to meet the wants of both elementary and advanced students, and trusts that he has not entirely failed of success.

3. The historical, critical, and controversial matter is printed in the smallest type, in which will be found most of that which is especially abstruse and metaphysical. This part of the volume is designed for a smaller and more select class of students and readers. The insertion of matter of this kind was absolutely essential to the usefulness of the work for the library, and was almost equally required for its authority as a text-book with the higher classes of students. There is at present so lively an interest in the history and criticism of speculative opinions, and so great activity in the scrutiny of those principles which are fundamental to physical, ethical, and theological science, that the author felt compelled to introduce this critical and historical matter in order to indicate the higher relations of elementary truths, as well as to guide the student in his reading of more extended works in the history and criticism of philosophical systems. He is aware that his own sketches and criticisms are somewhat condensed and abstract, but is sanguine in the opinion that some of them will not be without value as an aid in the use of more elaborate and minute histories of philosophy.

It would have been comparatively easy to prepare a manual embodying the principles of psychological science, with little or no illustration or criticism; but a compendious manual of this kind

must either be so abstractly dry as to be unintelligible; or so superficial as not to command the respect of the learner and reader; or so imaginative as to fail to inspire confidence. The applications of metaphysical philosophy must be familiarized to the mind by ample illustrations and frequent repetition, in order that the meaning and importance of the principles themselves may be understood and appreciated.

The following suggestions in respect to the use of the volume as a text-book may not be unacceptable. The matter in the largest type ought, in general, to regulate the length of the lessons. The examinations upon this should invariably be minute and severe. The explanatory and illustrative matter may be enforced more or less rigidly, or not at all, according to the interest and capacity of the student, and the methods and aims of the instructor. The less capable and less ambitious student may perhaps be held to the leading propositions, and to a very general acquaintance with the explanatory and illustrative matter. The more gifted and aspiring may be encouraged to master as much of this, and as thoroughly, as he is disposed, and may be ranked and rewarded accordingly. Such of the discussions as might be more intelligibly and profitably studied on a second perusal, may be reserved for the review. The historical and critical notes may be used as topics and guides for more minute researches and more exact criticisms, in written essays, by students and readers still more advanced. The volume is capable of being used in the various methods which have been indicated, and allows liberal opportunities for the skill and invention of the teacher. The marginal or side-notes are designed for the convenience of both pupils and teachers, and are reprinted in the synoptical table of contents.

The philosophy taught in this volume is pronounced and positive in the spiritual and theistic direction, as contrasted with the materialistic and anti-theistic tendency which is so earnestly defended by its advocates as alone worthy to be called scientific. The author, though earnest in his own opinions, has aimed to adhere most rigidly to the methods of true science, and to employ no arguments which he did not believe would endure the severest scrutiny

While his criticisms of opposing systems may seem to be polemical, he trusts they are not open to the charge of being unjust or unscientific.

It is with some diffidence that the author brings to the tribunal of public criticism the results of his solitary and almost unaided studies. Studies of this kind must, from their very nature, be prosecuted in a lonely way, and with the disadvantage of being often subjected to a superficial or partisan criticism. The publication of their results almost necessarily involves a critical, and often a controversial judgment of the opinions of others. As a writer upon such subjects cannot, if he would, avoid criticising others, so he ought not himself to expect or desire to be exempt from the severest ordeal of criticism, provided his own opinions are fairly and fully stated, and the counter opinions are thoroughly reasoned. The author has been tempted to delay the publication of his own opinions by the desire to mature them into a more complete philosophical system; but he did not think it right to do this for an indefinite period, especially at a time when the need of a comprehensive manual for higher instruction has been very extensively acknowledged, and when there is inculcated, in forms that are varied and imposing, a psychology that seems to him at once to be pretentious and superficial, and to involve a philosophy that is either defective or erroneous.

The author expects, if he continues to labor in the field of his chosen studies, to be able himself to detect some of the inadvertencies and errors into which he may have fallen. Should he be aided in doing this by the labors of friendly or unfriendly critics, he hopes to remember the words of the acute and excellent Berkeley: "Truth is the cry of all, but the game of a few. Certainly, when it is the chief passion, it doth not give way to vulgar cares and views; nor is it contented with a little ardor in the early time of life; active, perhaps, to pursue, but not so fit to weigh and consider. He that would make a real progress in knowledge must dedicate his age as well as youth; the later growth as well as first-fruits, at the altar of Truth. '*Cujusvis est errare, nullius nisi insipientis in errore perseverare.*'"

NOAH PORTER.

YALE COLLEGE, October, 1868.

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PART SECOND.

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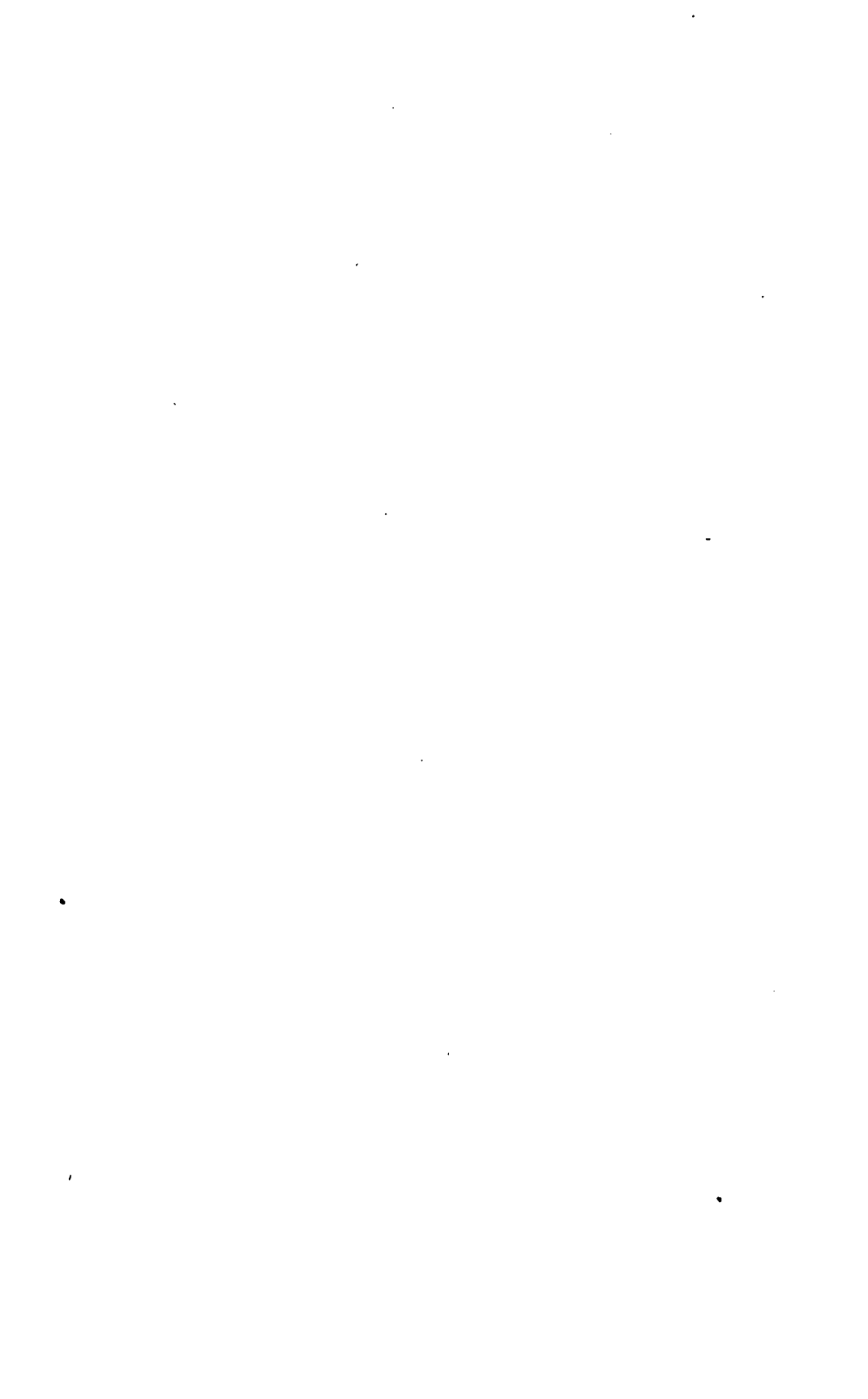
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INTRODUCTION.

PSYCHOLOGY AND THE SOUL.

I.

PSYCHOLOGY DEFINED AND VINDICATED.

Psychology, and
kindred terms.

§ 1. Psychology is the science of the human soul. The appellation is of comparatively recent use by English writers, but has been familiar in its Latin and German equivalents—*Psychologia* and *Psychologie*—to writers on the Continent, for more than two centuries. It is now generally accepted and approved among us as the most appropriate term to denote the scientific knowledge of the whole soul, as distinguished from a single class of its endowments or functions. The terms in frequent use—*mental philosophy*, *the philosophy of the mind*, *intellectual philosophy*, etc.—can be properly applied only to the power of the soul to know, and should never be used for its capacity to feel and to will, or for all its endowments collectively. The terms *metaphysics* and *philosophy*, when used without an adjunct, cannot designate any special science, and therefore are not properly used of the science which is concerned with the nature and functions of the human soul.

The term *Psychologia* was used by Otto Cansman, in his *Psychologia Anthropologica*, etc., 1594; also by Rudolph Goclenius, in *ψυχολογία h. e., de Hominis perfectione, anima et imprimis oris*, etc., 1597; vide Hamilton, *Met. Lect. VIII.*; Grasse, *Biblioth. Psychol.*; Gumposch, *Phil. Lit. d. Deutsch.*, pp. 56, 57. Other reasons are given by Hamilton in the Lecture referred to, for preferring *psychology*, particularly that it admits the adjective *psychological*.

The words *mind* and *mental* have been used by English writers to denote the soul's capacities to know, feel, and will, but with a more or less distinct apprehension of the impropriety, it being generally conceded that these terms signify the cognitive or intellectual function. *Intellectual philosophy* is a term too precise to admit any mistake in regard to its import or application. *Moral science*, *moral philosophy*, and still more frequently the *moral sciences*, have been used most improperly as including the philosophy of the intellect. In this improper application, the word *moral* is interchanged with *spiritual* or *psychical*.

Psychology a sci-
ence.

§ 2. Psychology is a science. It professes to exhibit what is actually known or may be learned concerning the soul, in the forms of science—i. e., in the forms of exact observation, precise definition, fixed terminology, classified arrangement, and rational explanation. This it aims to accomplish. Whether the

materials are sufficiently abundant for this use, or whether they can all be successfully reduced to these forms, are inquiries which may be considered more properly hereafter. Perhaps they can be still more satisfactorily answered by successful achievement.

It is the science of the soul; i. e., the science which has the soul for its subject-matter. The word *soul* differs from spirit as the species from the genus: soul being limited to a spirit that either is or has been connected with a body or material organization; while spirit may also be applied to a being that has not at present, or is believed never to have had such connection.

Psychology is usually limited to the science of the human soul, in its connection with the human body, i. e., as it manifests powers and is the subject of phenomena in its present conditions of existence. It does not concern

Limited to the human soul.

itself, except incidentally, with inquiries such as these: How or when does the soul come into being? Can or will it exist under other conditions, separate from a body, or connected with another body? What powers may it develop, or what phenomena may it exhibit in another state or condition of being? It simply asks, What does the soul achieve, and what does it thereby show itself to be, while connected with a human body? or, in the language of science, What are its phenomena, and what is its essential nature, as manifested under the conditions of corporeal and earthly existence? It does not even occupy itself with all these phenomena, but it limits its attention almost exclusively to those higher functions which are commonly recognized as distinctively and preëminently human, to the neglect of those inferior endowments which man shares with the lower animals.

The term *soul* originally signified the principle of life or motion in a material organism. It was preëminently appropriated to the vital principle or force which animates the animal body, whether in man or the lower animals. Traces of this signification may be distinctly discovered in the threefold division of man into body, soul, and spirit, in which the soul occupies the place between the corporeal or material part, and the spiritual or noetic. This intermediate part was sometimes called the animal soul, and was believed to perish with the body. Hence, the term *spirit* was applied to a nature that had never been fixed in a body, or soiled and degraded by connection with it. In the New Testament, *ψυχὴ*—*psychical*—is often applied to the body in the sense of animal, and opposed to the spiritual or higher body. As applied to the affections and character, it signifies those which are lower or fleshly, as distinguished from those which are nobler in their nature or origin. Inasmuch as in man the attention would naturally be directed to that which gives him dignity, it is not surprising that when the soul was limited to man, and signified the human soul, it came to designate by eminence those endowments by which man is distinguished from the animals instead of denoting, as previously, those which he has in common with them. We recognize somewhat of the earlier and lower meaning in the phrases, "The soul of the universe," "The soul of a plant," "The soul of an enterprise or interest;" i. e., the animating principle of the universe, etc., etc.

Relations to physiology and anthropology.

§ 3. Psychology is distinguished from physiology and anthropology. Both these sciences take man for their subject.

Physiology studies man as a material organism; distinguishing the several organs of which it is composed, the special functions of each, and the combined activity of all in a living being. It is true the structure and arrangement of some of these organs cannot be explained except by a distinct recognition of the necessities of the spiritual agent. But although physiology must recognize the higher functions and phenomena of the soul, it need only consider those which are familiarly known. For its purposes, the knowledge, the classifications, and the terminology

of common life are quite sufficient; as when it explains the structure of the eye, the ear, and the hand, by their relation to human vision and hearing, to tactual or mechanical skill. The principal and almost exclusive sphere of physiology is the bodily structure and functions, as phenomena that can be observed and explained with reference to the animal economy or the laws and conditions of bodily development and life.

Anthropology, as the term imports, treats of the whole man, as body and soul. It differs from psychology in that it treats of these factors when combined so as to form one product in many varieties. Of this product it gives the natural history. It investigates man as this complex whole, as he is varied in temperament, race, sex, and age; and as he is affected by climate, employment, or a more or less perfect civilization. It inquires now he is formed and changed in body and in soul by inherited peculiarities and accidental circumstances. It discusses the influence of the soul upon the body and the influence of the body on the soul in the normal and abnormal states and functions of each. But it notices and records the obvious phenomena of each, only so far as they are open to general observation and require no scientific analysis or explanation. To psychology it leaves the special and profound study of the one; to physiology, the more thorough examination of the functions of the other.

A more exact division of anthropology separates it into somatology and psychology. Somatology signifies the science of the body only, and is subdivided into anatomy and physiology; anatomy being the science of its structure, and physiology the science of the functions of its organs. Psychology might also be divided into the lower and higher psychology. It has been distinguished by earlier and later writers as empirical and rational, the first giving the facts, the second the rationale, or the philosophical interpretation of the facts.

§ 4. Psychology is distinguished still further from physiology in that the phenomena with which it has to do are apprehended by consciousness; while the phenomena of physiology are discerned by the senses. Psychology proceeds on the assumption that certain facts or phenomena may be known by the soul concerning itself. The power of the soul to know itself and its own states is termed *consciousness*. How the soul gains this knowledge, and what are the nature, the varieties, and the aids of consciousness, will be considered in the proper place. At present we simply observe, that psychology is strikingly distinguished from physiology, in that it derives the materials or objects of its knowledge and inquiries from a source peculiar to itself.

That the soul does know itself, and confides in the knowledge thus attained, will be acknowledged by every one. The facts are peculiar, differing greatly from, or, as we say, being totally unlike those which we gain by hearing, seeing, and touching. They are very numerous, coming and going faster than we can recall or describe them. They are various in their quality, differing from each other in important features, as states of perception from states of

Phenomena
known by con-
sciousness.

emotion, and yet having this feature in common, that they are known by the soul to which they pertain, and known to belong to itself. Seeing differs from hearing. Both are unlike remembering and imagining. All these together are unlike hoping, fearing, rejoicing and sorrowing. Hoping differs from fearing, and rejoicing is unlike sorrowing. And yet seeing, hearing, remembering, imagining, hoping, fearing, rejoicing, and sorrowing are observed by the soul that experiences these several states, and are known to be its own.

§ 5. These phenomena, so numerous and peculiar, excite the desire and effort to reduce them to the exactness and symmetry of scientific knowledge. That they actually occur, cannot be questioned. No one doubts, or cares to deny, that he thinks and remembers, that he hopes and fears. They are the most interesting of all events to the individual who experiences them. The knowledge and the imaginings, the hopes and fears, the joys and sorrows of each person, make up the most important part of his being. Even if we lay out of view their relation to us as sources of enjoyment and suffering, our internal states go very far to decide our success or failure in the business of life. What we accomplish in our acts and achievements, depends most of all on what we are in our thoughts and aspirations, in our plans and energy. The mind, which we know so well, is ever at our hand as the instrument with which we execute our purposes and direct our acts. The soul within us is the well-spring ever open at our door and springing up at our feet, from which we draw our most satisfying joys and our bitterest sorrows.

Its phenomena
impel to sci-
entific study. Surely phenomena like these are the legitimate object of those scientific inquiries to which we are so powerfully impelled. The phenomena which are so near us at all times—which intrude themselves upon our attention even when we desire to exclude them, which constitute the world within, to which the man himself alone has access, but which is yet, to him, more important than all the world without—deserve to be studied, and, if possible, to be scientifically classified and accounted for. We naturally ask, How do they occur? By what powers are they produced, and under what conditions? What laws do they obey? What is the soul; is it matter, only of finer texture and more delicate organization than in the plant or animal? If it is not matter, what is the mysterious substance or agent which works out these phenomena? If spirit, it obviously holds certain relations to matter; what are they: what are the material conditions under which it perceives, remembers, thinks, and believes?

Whatever may be the answers which we receive to these inquiries, we are impelled to make the inquiries. Should the issue disappoint us, we must still investigate. Should we return from our search with the conviction that nothing can be found, though disappointed of the object which we sought, we should feel a kind of satisfaction in knowing that nothing can certainly be known, if that indeed is true. Should we conclude that the soul is material, and that thought and feeling are secreted from the brain, we should still be impelled to seek for and find the truth which degrades and disappoints us.

If, on the other hand, these scientific inquiries lead to the conclusion—as we believe they will when rightly conducted—that the soul is not material, but spiritual, and that for its use and ends the material universe exists and is arranged; if the powers of the soul are seen by science to have been constructed for its moral perfection, and to point to this as their chief and ultimate end; if the conditions of its existence in a material body conduce to its

discipline to a perfect character, and promote its preparation for a more exalted and noble state, these conclusions will be satisfying not merely from the intrinsic value of the results themselves, but because they are confirmed by the most searching investigation. Our views of these truths are more enlightened when they are illumined by satisfying reasons for holding them. They are more comprehensive, because they are gained by a wider view of the facts and relations which pertain to them. They are therefore held more firmly, more serenely and, if need be, more heroically.

Prejudices against psychology and metaphysics. It is sometimes said, that we ought to acquiesce in the commonly received opinions—the so-called “teachings of nature”—in respect to these phenomena, and not attempt to define them in precise or accurate language, to account for them by discovered laws, or to arrange them in a scientific system. It is pertinent to suggest, in reply, that “nature” seems to impel us to be dissatisfied with her teachings, and to force us to

seek more exact and scientific knowledge than these “natural teachings” furnish. The “commonly received opinions” come no more truly by “nature” than do “reading and writing.” They are the products of certain philosophical inquiries in respect to the soul—the bequest perhaps of some forgotten philosophical school—which have slowly wrought their way into the minds of the community through books, teachers, and preachers, and have become so generally accepted that they seem to be truisms.

Depreciating views of psychological and metaphysical studies are frequently urged and more frequently cherished in silence by the devotees of the physical and applied sciences. Such persons have been known to carry the practical joke which exposes their own ignorance so far as to limit the terms *science* and the *sciences* to the study of those objects which we can see and handle; as if the word *science* might be applied to the knowledge of every other object and activity in the universe, and denied to the knowledge of the one agent and the one process by which these sciences are achieved. They will not condescend to apply it to inquiries concerning the instrument of all scientific knowledge, or to those conceptions and relations which underlie all science, without which geometry, mechanics, chemistry, geology, syntax and philology, law and government, have no meaning, are capable of no method, and can produce no conviction.

It might easily be shown to the satisfaction of all such decriers of metaphysics, that every one of the physical sciences begins with metaphysical conceptions and propositions. With these, both teachers and learners may indeed rarely concern themselves, for fear, perhaps, of being puzzled beyond the possibility of self-extrication, and so they either quietly ignore them, or confidently accept as a teaching of nature, or an axiom of common sense, the *casus mortuus* of a defunct school of metaphysics. Such persons might profitably exercise themselves with a few questions touching their own sciences, before they attack the psychologist as a dealer in unprofitable speculations, whose subject-matter is intangible, and the results fruitless. They might consider questions like these: What is a point? What a line, square, and cube? What is matter? What is the difference between a material substance and its properties? What is a material cause, power, and law? What is the nature, foundation, and authority of the inductive process?

The jurist might properly be sometimes summoned to his own bar, and required to define more exactly—i. e., more metaphysically—the elementary notions, and to justify more carefully the fundamental principles of his own science. Or he might with reason be reproved from the bench for the inaccurate and slovenly positions which, through defect of metaphysics, he lays down as undisputed maxims of natural justice, the deep foundations on which are reared the elaborate and imposing structures of artificial jurisprudence and positive law.

Value of Psychology. It requires and promotes self-knowledge.

§ 6. It may seem needless to dwell upon the value of psychological studies. They are peculiar in this, that, to whatever power of the soul they are directed, they both require and strengthen the habit of self-knowledge. No real knowledge of the soul can be gained except by turning the gaze inward. Each student must do this himself, for no one can do it for another. Books and instructors, essays, poetry, and the drama, cannot describe or teach that which is not confirmed by the researches of the learner within his own spirit. For the man who is disposed to reflect, they can do much, by instructing him where and how to look; but to him who will not converse with himself, they can impart no instruction. To such a man they must speak in an unknown tongue. They cannot create conceptions in the mind that has

not verified or will not verify them in its own experience. They speak only words to him who does not bring the answering thoughts from his own reflective self-acquaintance.

This discipline to reflection, with the habits which it forms, is valuable because it teaches self-control. He that studies his own powers, may learn how to direct and use them. He may learn how to fix his attention, how to invigorate and refresh his memory, how to order and arrange his thoughts. He may discover what are his intellectual defects, and the reasons why he can perform some processes with ease, while others cost pains-taking and effort. He may acquire the skill to correct his deficiencies and to overcome his bad habits; to make easy that which was difficult, and pleasant that which was disagreeable.

It also lays the foundation for moral self-improvement. He that would improve his character, must first know what his character is. He must discover what are his better and what his worse impulses; what are the points at which he is most easily assailed, and by what sensibilities or emotions he can most readily rally his forces and overcome their assailants. With self-improvement, self-government is intimately associated. Indeed, the one cannot exist without the other. He that would make himself better, must learn to set himself over against himself as his own master, repressing the evil, and educing and encouraging the good. But he that would rule himself, must first know himself. He must thoroughly understand the subject whom he would regulate and control. "Know thyself," was written over the portal at Delphi. It was inculcated by Socrates, that preëminent teacher of practical ethics, who, measuring every species of knowledge by its tendency to make man better, regarded this maxim as the summary of wisdom. A Christian poet has said, in the same spirit,

"Unless above himself he can
Erect himself, how mean a thing is man!"

§ 7. The self-knowledge which psychology fosters, and to which it insensibly trains, is the one instrumentality by which we learn to understand our fellow-men. The sharp and searching look by which one man sees through another, and reads the secret which he is unwilling to confess, is attained only by the fine and subtle analysis of one's self. What is perceived, are only external signs; as a word, a look, a gesture. To the thought, the wish, the purpose which they suggest, there is no direct access. The only thoughts and wishes which the interpreter can know directly, are his own; and it is by a close and habitual study of these that he is able to connect them with the signs through which those of other men are revealed.

§ 8. If, also, we would know our fellow-men to do them good, we must first know ourselves. This suggests the important service which psychology may render to teachers of every class; from her who communicates to the infant the first elements of its "mother-tongue," to him who toils with his fit though scanty audience along the loftiest heights of philosophical thinking. It is the office of the teacher to communicate knowledge. But to communicate is more than to acquire, or to possess, or to express in the language that satisfies one's self. The teacher should *impart*—i. e., awaken in the mind of another—the thoughts which exist in his own. He must cause his own

Trains to self-control.

Trains to the knowledge of human nature.

Is indispensable to educators.

thoughts to be received by his pupil. He must make sure that they are easily followed and reproduced; that the order in which they are arranged is adapted to the condition and wants of the recipient, and that the full force of the reasons by which he argues is responded to and felt.

Hence, skill in the method or art of teaching, as distinguished from the possession of knowledge, depends almost entirely upon the power of a man to measure and judge of the effect of his instructions. The clear, methodical, and satisfactory communication of knowledge follows from often asking, What truths are most easily and naturally received at first, or as the foundation for others? What illustrations and examples are most pertinent and satisfactory? What degree of repetition and inculcation is required in order to cause the impression to remain? How can individual peculiarities of intellect be successfully addressed, and, if need be, corrected? Such questions can only find answers through the habits and knowledge which come from intelligent self-study.

Variety of educators. The so-called teacher is not the only person who educates his fellow-men. The editor, the preacher, the public lecturer, the political speaker, the man who gains another over to his views by conversation, the parent who imparts the knowledge and principles, the truth or error which strike the deepest and live the longest, these all are in the truest sense teachers. The art or skill which they possess and use, depends to a certain extent on qualities of manner, style, or address, but most of all on the knowledge, who the men are with whom they have to do, what are the facts or truths which they are prepared to receive, and in what method and order they should be presented so as to be received most advantageously. To this skill no study or training so directly contributes as those derived from psychology. Hence, the science of *Pedagogic*, or instruction in the science and art of teaching, has been usually entrusted to the students and devotees of psychology and philosophy. Locke's treatise on the *Conduct of the Understanding* was a natural and almost a necessary result of his well-known *Essay*.

It aids in moral culture.

§ 9. Education is something more than the communication of knowledge. It includes the training of the sensibilities, which are the springs of action, and the forming and fixing of the character. To this the knowledge of the feelings is as requisite as the knowledge of the intellect, and it is attained by a similar method. Those who influence the character and conduct of their fellow-men by public discourse or private conversation, by the persuasion of words or the magic power of look or gesture, those who seduce to evil or win to good, are, in the appropriate sense of the word, educators, as truly and often with greater potency than the teacher in the school or the professor from his chair.

The knowledge of the ways by which men are to be moved and won, whether it is transfigured and exalted to the divinest uses, or debased to the lowest arts of the demagogue and the seducer, is dependent on the single condition of self-observation, and is promoted, stimulated and perfected most of all by the habits and training which come from psychological investigations. The sharp pettifogger, the mischief-making gossip, the artful intriguer, the venal politician, as well as the wise counsellor, the inspiring teacher, the divine philosopher, and the eloquent preacher, open the fountains of their inspiration to evil or good, first to the study of their own souls.

Disciplines for
the study of literature.

§ 10. We name another advantage from psychological study—the training which it ensures for the appreciation and enjoyment of literature, and the increased facility it imparts in writing that which may be worthy to be read. The great masters in literature, especially in poetry, fiction, and the drama, have sounded the depths of the human soul. They have studied man most attentively in the several phases which his being assumes, and as moved by the many varieties of human feeling and passion. They may not have learned all the technical names which are given to his capacities, or been taught in the schools all the theories which have been formed of the essence and powers of the soul; but they have studied its thoughts and feelings to the most effectual purpose, and have exhibited the results of their studies in characters of surpassing interest, and by words of wondrous power. From their works the student of psychology may find most valuable aid and, to enjoy and appreciate them, there is no study which is so accessory as the systematic study of the human soul, with the habits and tastes which this study engenders. No fact is better attested by the history of literature, than that those trained by such studies enjoy with especial zest the best literary productions, and appreciate them more keenly than any other class of men. Other things being equal, they are better qualified than any others to criticise them fairly and intelligently.

Is not unfavorable to creative power.

It has been questioned whether the reflective and critical tendency thus fostered is favorable to the power of originating productions of the highest order. Eminent examples may be cited from the history of letters, of those who have been distinguished for these habits, as Milton, Gray, Bacon, Hume, Gibbon, Grote, Goethe, Schiller, who have also been distinguished for the power of original creation. In many departments of literature, there can be no doubt that the attentive and critical study of the soul gives power to originate successfully as well as to judge acutely. The arm that measures its strength and steadies its aim by the judging eye, will reach the mark with greater precision, and its energy need be none the less.

Disciplines to moral reflection.

§ 11. We ought not to omit the peculiar grace and charm which is lent to the character through the influence of that moral reflection which is the natural result of self-acquaintance. To learn to put ourselves in the condition of others, by imagining what would be our expectations and what our feelings were we in their place, not only disciplines and guides to that common justice which the laws enjoin, and to that unselfish morality which the Golden Rule prescribes, but it is the secret of that considerate sympathy and refined courtesy which invest with a peculiar attractiveness a few superior natures. It is by this process that we learn to clothe the severe form of heroic allegiance to duty with the graceful robe of unselfish, sympathetic, and divine charity.

Dr. Thomas Arnold was accustomed to make much of what he called "moral thoughtful-ness," as the trait of character which he desired most of all to perfect in his pupils, and which

be defined as "the inquiring love of truth going along with the divine love of goodness." This "moral thoughtfulness" is fostered by self-acquaintance, when prosecuted with the honest purpose of self-improvement. This self-knowledge makes a man to be *just* to others, because he is severe to himself; to be *modest*, because he compares himself with others; to be *candid*, because he views their merits and defects as if they were his own; to be *sympathizing*, because he feels their joys and sorrows as experienced by himself; to be *courteous*, because he would express by word and act, by look and tone, his acknowledgment of their rights and his sympathy with their feelings; to be *indignant* at wrong, because, in the evil intended for another, he feels a blow aimed at himself.

It leads to a wider sympathy with man than is bounded by the circle of acquaintances, of country, or even of those now living. It conducts the thoughts backward along the history of the past, and forward among the problems of the future. It makes one sad at the stories of human suffering, and buoyant in the contemplation of human excellence in characters conspicuous for faithfulness and heroism. From this enlarged sympathy arise more hopeful and tolerant views of present evils, a firmer faith in the promises of Providence and the prospects and progress of man, a more cautious and candid estimate of the excitements and prejudices which attend the partisan conflicts of the passing hour. Superior natures, in all situations in life, have ever been reflective natures. When the opportunity has been furnished, they have been attracted by psychological studies and fascinated by the mysteries which they attempt to unveil and resolve.

Psychology the
mother of the
sciences which
relate to man.

§ 12. Psychology either furnishes or reveals the first principles for all those sciences which either directly or remotely relate to man—which concern his being, his aspirations and

wants, the products of his genius, his institutions, his studies, or his destiny. It is from psychology that all these sciences derive their definitions, and it is in psychology that they find the evidence for their truth. They all begin with certain propositions, which they assume to be true. If their truth is questioned, the final appeal is made to the science of the human soul, as the highest court, beyond which there can be no resort.

the relation to
ethics.

Thus ethics, or the science of human duty, sets off with certain positions in respect to the nature of man, which assert that he is fitted for moral action, and that to right or virtuous activity he is impelled by the most sacred obligations. It defines conscience and duty, and the several relations of man, and from its definitions derives, by logical inference and analysis, the rules and maxims of practical ethics. But is man a moral being? What is it to be capable of moral activity and obligation? Is he endowed with conscience? What is conscience? These questions are all questions of fact, and can be answered only by the psychological study of man.

To political and
social science.

Political and social science also assumes that man is a social being, and that he is formed for and must exist in organized society. It defines the rights and obligations which grow out of this constitution. But is man thus endowed? and what is he as a social and political being? Psychology alone can answer.

To law.

Law, or the science of justice, lays down as its axioms certain assumptions in respect to the authority and limits of government, for the truth of which it must appeal to the consciousness of every one who consults his own inner life. This science is therefore carried back step by step, till its last footing is firmly fixed in psychology.

Aesthetics, or the science of criticism, assumes that man is pleased with the beautiful and elevated by the sublime; and that he can form distinct conceptions of what is fitted to attract him in both. From these conceptions he can derive rules by which to try and measure whatever interests him in literature, nature, or art. The canons of taste are in the last analysis resolved by facts of psychology.

Theology is the science of God, of man's relations to God, and of the will of God as made known to man. But this science must assume that man is, in his nature, capable of religious emotion; as also that he believes in God, and can in some way understand His character and His will. What man believes, and how he comes to believe it, are in great part to be explained by psychology. Theology must go to psychology to vindicate its primary conceptions and justify its elementary principles. The science of religious faith and feeling must, so far as it is a science, rest on psychology.

From these considerations, psychology is shown to be the common parent of many of the sciences. To every one of these sciences the study of psychology furnishes the necessary groundwork, and is itself the necessary and appropriate introduction for the thorough understanding and orderly development of their teachings.

§ 13. To logic and metaphysics, psychology stands in a peculiar and most intimate relation, to understand which special consideration is required. Psychology, in one aspect, is, like all the sciences of nature, a science of observation; and it is subject to those rules of investigation and of evidence which are common to them all. We study the soul aright when we collect and resolve its phenomena according to the inductive method; when we reason from premises to conclusion; when we infer, by analogy with similar phenomena; and when we arrange our products in the order and beauty of a complete and consistent system. Hence it follows that psychology, though necessarily, as we have seen, the parent and director of many sciences, is itself in a most important sense subjected to logic as its guide and lawgiver.

But logic is itself subject to another science, viz., metaphysics, or speculative philosophy, inasmuch as this is the science of those necessary conceptions and fundamental relations on which the rules and the processes of logic are founded. Such are the conceptions of substance and attribute, of cause and effect, of means and ends, and the relations of inherence, causation, and design. Unless these are assumed, the concept, the judgment, the syllogism, the inductive process, the system, can have no meaning and no application. Psychology is therefore subject to logic as its lawgiver, and logic to metaphysics as its voucher.

But though, in the order of thought and methodical construction, psychology is subject to these sciences, yet, in the order of time and of acquisition, psychology is before these sciences, which are fundamental to itself and to all the other sciences

Special relation
to logic and meta-
physics.

Relation of logic
to metaphysics.

Psychology sub-
ject to, yet be-
fore logic and
metaphysics.

We must, in a certain sense, go through psychology in order to reach the logic by which we study psychology. Logic teaches the laws of right thinking. But what is it to think? what are the processes which it involves? We must ask these questions, in order to discover and prescribe the rules of thinking. We answer them by resorting to the facts which consciousness discloses. Metaphysics evolves the original conceptions which appear in all science, and the ultimate relations which are assumed in the language and inquiries of all the special philosophies. But what are these original conceptions, these prime relations, these categories, of which every particular assertion and every actual belief is only a special exemplification? Psychology only can answer, as, by her analysis, she shows that man performs processes and achieves results in which he necessarily originates and applies these conceptions and relations. By studying the mind, we discover the laws by which both mind and matter can be studied aright. By studying the mind, we unveil and evolve the necessary conceptions and primary beliefs by which the mind itself interprets or under which it views the universe of matter and spirit. It is, then, through psychology that we reach the very sciences to which psychology itself is subject and amenable. Psychology is the starting point from which we proceed. Psychology is also the goal to which we must return, if we retrace the path along which science has led us. In synthesis we begin, in analysis we end, with this mother of all the sciences.

Why psychology is so often called philosophy.

This special relation of psychology to these fundamental sciences explains why psychology is itself so often called philosophy and metaphysics, while it is neither, but simply a science of observation and of fact. It does, however, lead to philosophy and to metaphysics, as we have seen by the discoveries which it evolves and the habits to which it trains. It is the natural introduction to metaphysical or philosophical studies, for its own investigations will conduct the mind step by step to those inquiries which will bring into view those conceptions and relations, concerning the authority of which speculative intellects have disputed in all the schools. These conceptions and relations are employed in all the special sciences of nature, or, in the language of the ancients, in all *physics*, whether the *τὰ φυσικά* are material or spiritual. Hence it may be that all inquiries concerning them were called metaphysical, as beyond, or preliminary to, the physical, and the science was called *metaphysics*. Hence psychology itself was called philosophy, as it conducted to philosophy *par excellence*, the *prima philosophia*, which is fundamental to all the special and applied sciences.

A discipline to method.

§ 14. It is obvious that, if psychology holds these relations to so many special sciences, the study of it must of itself be a most efficient discipline to method and logical power.

"What is that," says Coleridge, *The Friend*, Sec. II., Ess. 4, "which first strikes us, and strikes us at once in a man of education? and which, among educated men, so instantly distinguishes the man of superior mind, that (as was observed with eminent propriety of the late Edmund Burke) we cannot stand under the same archway during a shower of rain, without finding him out? Not the weight or novelty of his remarks; not any unusual interest of facts communicated by him," etc. etc. * * * "It is the unpremeditated and evidently habitual

arrangement of his words, grounded on the habit of foreseeing, is each integral part, or (more plainly) in every sentence, the whole that he intends to communicate. However irregular and desultory his talk, there is method in the fragments."

It is impossible for a person to be accustomed to reflect upon his own psychical states, to analyze them into their elements; to trace his practical maxims and his scientific axioms to their fundamental principles, or to evolve them from their psychological processes; it is impossible that a man should be thus disciplined without acquiring the power of thinking clearly, rationally, and by orderly processes, and without also gaining the power to express his thoughts in a lucid and convincing manner. To whatever subject of investigation or business in life such a student may apply the discipline thus acquired, he will bring to it a mind capable of mastering the subject with satisfaction to himself and to others, and of gaining that supremacy which the man who thinks with order will always secure over those who think superficially, or who think with lack of method.

Even if one's profession or pursuit in life does not require him to be familiar with the facts of psychology or the principles of philosophy, he will retain the results of his studies in the habits of methodical and analytic thinking to which he will have been trained. But no man can wholly divest himself of the truths which he must of necessity have gained by such a training. The sources from which they have been derived, and from which they must be freshly confirmed, are open ever before him. The mine in which he has wrought so long is still open for his working, at his feet and by his door. If the habit has been once acquired of looking attentively at his inner self, and of there disclosing truths and finding reasons, it will not be abandoned. The same mine will continue to be wrought, because its products, freshly produced, will be constantly required on every occasion when common sense, the knowledge of men, practical wisdom or moral convictions, are demanded. The possession of these habits and the power of evolving such truths command the respect of all men, and invest their possessor with an influence and dignity, to which all men concede the rightful supremacy.

II.

THE RELATIONS OF THE SOUL TO MATTER.

Psychology a branch of physics; in what sense. § 15. Psychology is properly a branch of physics, in the enlarged signification of the term; or, the science of the soul is one of the many sciences of nature. Whatever may be thought of the substance of the soul, its phenomena are unquestioned facts. They are facts which are as real and as potent as the phenomena of gravitation or electricity. As such, they assert their place in that vast system of beings which we call Nature, or the Universe, and claim to be considered by the methods of inquiry which are appropriate to scientific investigation.

Why, then, are its facts at first distrusted by the philosopher? § 16. The true philosopher will admit the justice of this claim, and will proceed to consider these phenomena in the light of scientific methods. But when he begins seriously to study them, he finds, perhaps to his surprise, that they are very unlike the phenomena to which he has been accustomed. He discovers that the subject-matter of investigation, the phenomena, the agents, and the laws, are all strikingly and strangely peculiar. The inquirer is surprised, dis

turbed, and perhaps offended. He is surrounded by unfamiliar objects. He is summoned to consider processes to which he is unaccustomed. He is required to reflect upon phenomena that are out of his usual range, and to assent to principles which he has never before recognized nor applied.

The first impulse is, to question the reality and trustworthiness of the facts themselves; the next, to doubt whether they can be distinctly conceived and accurately defined. If it be conceded that they are actual, and worthy to be investigated, it is at once presumed that they may be attributed to some material substance or agent, or explained by material laws, or at least illustrated by material analogies. This tendency to resolve the soul into matter, or to judge the soul by matter, is very strong; at times it is almost irresistible, and it has in all ages exerted over the most candid and truth-loving minds a powerful and unconscious influence. The influence of these prepossessions may be traced in the works of almost every writer on psychology; if not in the conclusions which he reaches, at least in his modes of reasoning, his illustrations, and even in the very language which he necessarily employs, and by which he is unconsciously influenced. It has become, therefore, almost a necessity, in an Introduction to the study of this science, to consider this influence distinctly, so as to account for its existence and to guard against its effects. For the same reason, it is desirable, also, so far as we can do this by a preliminary view, to determine distinctly what are the relations of the soul and its phenomena to the essence, powers, and laws of matter.

Material phenomena are the earliest known.

§ 17. We would first account for the existence of this tendency. By the natural course of development and training we are for a long period exclusively occupied with material phenomena and material laws. In one sense it is true that nothing is so near to any person as his own inner self, and no events or phenomena are so interesting as the experiences of his own soul. Even the material world interests us only as through the sensibility of the soul we are alive to joy or sorrow, to comfort or deprivation. If there is 'no music in the soul' of the listener, the sweetest notes and the most elaborate harmonies are sounded in vain. If the sight awakens no pleasure, and the food provokes no taste, they are nothing to us.

Notwithstanding this, that to which the mind attends, and with which as an object of thought it is most earnestly occupied even in joy or sorrow, is the outward and material. What the man sees and hears and smells and tastes, attracts and absorbs the attention. Even when he begins to reflect, the objects which he compares and distinguishes, which he classifies and arranges, are almost exclusively sensible objects. When he rises to scientific knowledge, it is to the science of material things. The properties and powers with which he first becomes familiar in the way of science, are the properties and powers of matter. The laws of mechanics, of fluids, of light, of chemical union, of vegetable and animal life, are the laws which he first studies, masters, and learns to apply and to trust. The objects to which they pertain address the senses. They are permanent before the mind. Experiments can be instituted by which theories can be tested and hypotheses can be proved. These phenomena engage the attention of all mankind, and to discern, describe, and under

stand them requires no special reflection and no unusual or abstract language. It is in the order of nature, therefore, that the sciences of matter should precede the sciences of the soul. It follows, by a natural and almost a necessary consequence, that the conceptions and methods of investigation, the facts and laws which are appropriate to material objects, should so control the mind's habits and associations, should be so inwrought into its very structure, as to take almost exclusive possession of its active energies.

§ 18. When we pass over from the study of matter to the study of spirit, the prepossessions which we have considered remain with us. We are at once confronted with new and strange objects. Though the states of the soul have been the nearest to our experience and the most familiar to our enjoyment, they have been removed the farthest from our observation and study. We ask, Are they real? Are they actual and substantial? Surely they are not like those phenomena which we see and hear, which we handle and taste. But allowing that they are actual phenomena, are they distinct and definite? Can we compare and class them? To what substance do they pertain? The readiest answer is, To some material substance. Hence the soul is readily resolved into some form of attenuated matter. Its functions are explained by the action of the animal spirits, or by chemical or electrical changes in the nervous substance. Perception is explained by impressions on the eye and the ear, which impressions are referred to motions in a vibrating fluid without, which in turn are responded to by motions aroused in a vibrating agent within. Memory and association are explained by the mutual attractions or repulsions of ideas similar to those to which the particles of matter are subjected by cohesion or electricity. Generalization and judgment, induction and reasoning, are resolved by the frequent and often-repeated deposits of impressions that have affinity for one another, and are thus transformed into general conceptions and relations.

From these tendencies and prepossessions have resulted the various schemes of materialism, the grosser and the more refined. By these influences we can account for the ready acceptance of phrenology, with its more or less decided material affinities. To the same we refer the occasional semi-materialistic solutions of psychical phenomena, which occur in many treatises and systems which are far from being avowedly materialistic. By them we can easily explain those modes of thinking and speaking in respect to the soul in which resort is had to some law or principle of matter to explain a phenomenon which is simply and purely spiritual. Even those who on moral or religious grounds believe most firmly in the spiritual and immortal existence of the soul, often fall, in the scientific conceptions which they form of its essence and its actings, into modes of thinking and reasoning which are more or less plainly material. Especially are they easily puzzled by objections which derive their sole plausibility from material analogies. These phenomena are not at all surprising. The mind that is trained by the most liberal culture, or that is schooled to the most complete self-control, cannot easily divest itself of the prejudices and prepossessions which have been contracted by previous studies. Indeed, there is reason for the observation, that the man devoted to a single class of

studies or department of science is liable to stronger and more inveterate prejudices than he whose one-sided views have not been strengthened by reflection, tested by experiment, and enforced by authority. The man confirmed in his associations by means of a familiar master; over some physical science, is the man of all others to whom, when he considers the phenomena of the soul, the facts seem most novel and the conceptions most unfamiliar.

§ 19. But it is not enough to be forewarned of these influences, in order to be forewarned against them. We need to be convinced that they are founded in error and misconception; we should be satisfied that the science of the soul can vindicate its peculiar conceptions and laws. In order to this, we need to take a general and preliminary view of the relations of the soul to matter. A complete and final theory of these relations can only be gained at the termination and as the result of our investigations. In order fully and satisfactorily to answer the questions, 'Is the soul material?' 'Wherein is spirit with its phenomena like, and wherein is it unlike matter?' we must first have studied each, and the means of knowing each; *i. e.*, we must have prosecuted a thorough study of philosophy and psychology. There are, however, certain considerations which are appropriate to a preliminary view. These we propose to present—first, those which may fairly be urged by and conceded to the materialist, or the materialistic psychologist; and second, the considerations which indicate and prove that the soul has an activity that is uncontrolled by material agents, and follows laws that are peculiar to itself. We shall give the argument of the materialist in its most forcible form, omitting no source of evidence which modern science has furnished for his use. To all these facts and proofs he has a just and lawful claim, and the presentation of them is required by fidelity to science and to the truth.

The arguments of the materialist. The soul is connected with a body.

§ 20. The materialist urges, 1. That we know the soul only as connected with a material organization. That which is called the soul, exerts all its activities and manifests all its phenomena by means of the human body. Of a soul which acts or manifests its acts apart from the body, we have no experience, either by personal observation or through credible testimony. It must certainly be conceded that the only souls to which science can have access for the purpose of observing their functions or explaining their laws, are those which exist and act through a material structure.

The soul is developed with the body.

2. The powers of the soul are developed along with the powers and capacities of this organized structure. As these powers and capacities are severally called into action and reach their full perfection, so do the powers of the soul appear one after another, and attain the full measure of the energy which nature has assigned them. The lower organs of the body act first in order, and these are developed and matured at the earliest period. Afterward the higher organs are gradually matured and brought into action. After the body is

completely developed for all its functions, it passes through certain stages of growth, increasing in size and strength. During these periods of development and growth the soul is also unfolded and matured. One power after another is made ready to act, and the capacity for the action of each is enlarged and strengthened. If, now, the soul is unfolded as the body is developed, and if the soul grows with the growth of the body, then it would seem as though what we call the soul is but a name for the capacity to perform certain higher functions which belongs to a finely organized and fully developed material organism.

Is dependent on the body for its knowledge and enjoyment.

3. The soul is dependent on the body for much of its knowledge and for many of its enjoyments. It is through the eye only that it perceives and enjoys color, and through the ear only that it apprehends and is delighted with sound. All the knowledge which it gains of the material universe, whether near or remote, whether minute or extended, is acquired through the senses alone. It is only as a material organ is affected by a material object, that the mind makes a single new acquisition. Should these organs cease to exist, or cease to be acted on, all new acquisitions and new enjoyments would cease to be possible. Even the so-called higher kinds of knowledge and feeling have a nearer or remoter reference to the objects of sense with which we are brought in contact through the organs of sense.

Moreover, so far as we know, the soul begins to act and to enjoy only when these organs are aroused by their appropriate material excitants or *stimuli*; and it would never act or enjoy at all, either in its higher or lower forms, if these organs were not first called into action.

Also for its energy and activity.

4. The soul is dependent on the body, and on matter, for its energy and activity. It sympathizes most intimately with every change in the body. The capacity to fix the attention so as to perceive clearly, to remember accurately, and to comprehend fully, varies with the condition of the stomach and the action of the heart. A slight indisposition is incompatible with the performance of the simplest functions of the intellect, and with the exercise of those emotions to which the heart is most wonted. An active disease disorders the imagination, filling it with offensive and incongruous phantasies, which the soul can neither exclude nor regulate. The suffusion of the brain with blood or water, disqualifies the soul for action of any kind, or stupefies it into entire unconsciousness. A change in the structure or in the functions of the brain, or some lesion of the nervous system, induces that suspension of the higher and regulating functions which we call insanity. This state is permanent when its cause is permanent; and the soul may even relapse into a condition more helpless and pitiable, the condition of idiocy, from which it is never known to emerge. That state of the body which we call faintness takes away all conscious perception and enjoyment, and causes the soul to sink into blank inaction. Another state of the body in sleep induces

another kind of activity, in which the usual laws of perception, judgment, and memory, as well as the usual conditions of hope and fear, seem to be deranged or reversed. When the organization of the body is destroyed, the soul ceases to act, and, for aught we can observe, it ceases to exist.

5. The soul is the termination of a series of material existences, which rise above each other in orderly gradation, each preparing the way for the other; and all are represented in that form of organized matter which manifests and sustains the highest of all, *i. e.*, the phenomena of the soul itself. The lowest form of matter obeys mechanical laws. In this, the particles are held together by cohesive attraction, and the masses are bound by that force which causes the stone to fall, and the planets to move in their rounds, in obedience to a mathematical law. The form next higher is seen in bodies endowed with chemical properties and capable of chemical combinations. Here masses and molecules unlike each other unite in such a way as to form a third unlike either—a neutral result, in which the constituting elements do not appear. In the form next higher, matter disposes its particles in crystalline arrangement, according to the law of which the elements are not content with simple mechanical aggregation, nor with the more mysterious affinities of chemical combination, but arrange themselves in constant and definite external forms, more or less symmetrical, after the laws of a natural geometry. Next we find the lowest types of organized existence, of which the crystal is the mute prophecy. In these, from the highest to the lowest, there are separate organs, each of which performs a separate and special function, necessary to the existence and functional activity of every other organ and to the whole structure, which is made up of all the organs together. The plant, when the requisite conditions are present of nourishment, moisture, and light, expands into a developed organism, thrusts out the bud and leaf, opens the flower by which its beauty is perfected, and seed and fruit are formed and matured. The animal requires material conditions of food and air and light. It comes into being by peculiar processes, it grows into a complicated structure of bone, muscle, viscera, nerves, and brain, each separate organ fulfilling its special duty, and all acting together so as to form a completed whole. In connection with the more perfectly and delicately organized animal structures, the phenomena of the soul begin to appear, requiring as their condition all the lower forms of nature, the presence and the action of the mechanical, chemical, and organic powers and laws. Nay, more. So far as we observe the various grades of animal life, just in proportion to the perfection of the material structure is the perfection of the soul. The more simple the organization, the fewer are the instincts and the more limited is the intelligence. The more complex and delicate the structure, the wider is the range and the richer the capacities for knowledge, enjoyment, and skill. Again, the

It terminates a series of material existences.

human being, so far as the progress of its own development can be traced, seems to pass in succession through the lower up to the higher grades of organic life. It seems to take up into itself and represent all the inferior types of living beings. It is first, as it were, a plant, having only vegetative existence, in the capacity for nourishment and growth; then it becomes an animal, passing through the lowest to the highest forms of animal existence; last of all, it emerges into that which is still higher, the form of activity, which is intelligent, sensitive, self-conscious, and rational. It would seem, it is argued, that the soul and the body are one organic growth. The one is perfected with the other, the one depends on the other, the one results from the other. To this is added the consideration already noticed, that organic or nervous force, and psychical or mental force, go hand in hand in energy. As is the tension of the one, so are the activity and achievements of the other. The one also grows and is developed with the other, and with it wastes in decay, rests in sleep, is bewildered in dreams, rages in insanity, drivels in idiocy, is extinguished in death.

From all this it is concluded that the soul is nothing without the body, the two being different names for different functions of a common substance, and the soul a convenient term for the higher forms of activity which matter exerts in its finer and more ideal forms. Or, in other words, the soul, in its essence and its acts, is dependent on organization; and when the organism is disintegrated, the activity of the soul must terminate. Its existence separately from organized matter, or transferred to another and a new organism, involves an absurd and impossible conception,

Such is a brief sketch of the argument for the material structure of the human soul, as it might be urged at the present day by one familiar with modern science. The considerations are very general, but they embrace the most important parts or points of proof which it is suitable to consider at the introduction of our studies in psychology.

Counter arguments. Its phenomena unlike material phenomena.

§ 21. The considerations which may be urged in proof that the substance of the soul is not material, are the following:

1. The phenomena of the soul are in kind unlike the phenomena which pertain to matter. All material phenomena have one common characteristic—that they are discerned by the senses. They can be seen, felt, touched, tasted, and can also be weighed and measured. Certain phenomena of the soul, at least, are known by consciousness, and, as thus known, are directly discerned to be totally unlike all those events and occurrences which the senses apprehend. The phenomena discerned by the senses are known to have some relation to space that can be more or less clearly defined. Motion, color, taste, sound, combustion, breathing, circulation, secretion, galvanic agency, chemical combination, growth, decomposition—every kind and form of material activity—require extension

in the substance on which they operate, or in the effect or activity itself. But feeling, will, thought, memory, joy, sorrow, purpose, resolve, admit of no such relation to space. They are known to exclude such relation. Besides, each and all these material phenomena or properties are referred to some agent or substance which is also apprehended by the senses to be extended and endowed with other material qualities. Even those agents in nature which are most imponderable and impalpable, as the electric force or fluid and the vital or organic force in the animal or plant, both require a certain portion of matter as the active or potent substance, which must be electrified or made living in order to exhibit electrical or vital activity. This single characteristic of material agents is positively known and universally assented to. On the other hand, the phenomena of the soul are by consciousness not only not necessarily referred to any such portion of matter, but they are referred to another agent, the acting or suffering *ego*, which is not known by consciousness to have any sensible or material attributes, or rather, which is known to have no such properties. All these peculiarities clearly and sharply distinguish the two classes or species of phenomena. We positively know that all other phenomena have a definite relation to matter. Psychological phenomena have a definite relation to an agent which is not known to have a single material attribute; which, even when it controls matter, is known by consciousness to be totally unlike any known material agent.

The soul distinguishes itself from matter.

2. The acting *ego* is not only not known to be in any way material, but it distinguishes its own actings, states, and products, and even itself, from the material substance with which it is most intimately connected, from the very organized body on whose organization all its functions, and the very function of knowing or distinguishing, are said to depend. First, it distinguishes from this body all other material things and objects, asserting that the one are not the other. Second, it just as clearly, though not in the same way or on the same grounds, distinguishes itself and its states from the material objects which it discerns. It knows that the agent which sees and hears is not the matter which is seen and heard. Third, the soul also distinguishes itself and its inner states from the organized matter—i. e., its own bodily organs—by means of which it perceives and is affected by other matter. Fourth, it resists the force and actings of its own body, and, in so doing, distinguishes itself as the agent most emphatically from that which it resists. By its own activity it struggles against and opposes the coming on of sleep, of faintness, and of death. Even in those conscious acts in which it feels itself most at the disposal and control of the body it recognizes its separate existence and independent energy.

The soul is self-active.

3. The soul is self-active. Matter of itself is inert. The soul is impelled to action from within by its own energy. Matter only takes a new position, or passes into a new state

as it is acted upon by a force from without. We grant that the soul must begin its activities at the awakening of the senses; but when it is once awakened, it never sleeps, so far as we can observe or infer. If the senses should furnish it no new objects, it would go on without intermitting its action, busying itself with the materials already furnished under laws of its own. We grant also that to what it perceives and desires and does, it is determined, to a very great extent, by the objects which present themselves from without; but these direct the course of its action as they furnish objects; they do not cause it to act. We concede even that its energy in action is dependent on material conditions. The tension and healthful harmony of the nervous system enables the soul to act with augmented force. When the nerves are relaxed or disturbed, as in faintness or disease, the force of the soul is greatly weakened or frightfully disordered; but there is no proof that any bodily conditions can arrest the activity that is impelled from within, or that it is originated by any such conditions. In this respect the contrast is striking between matter and spirit.

Is not dependent on matter in its highest activities.

4. To very many of the states of the soul no changes or affections of the organism can be observed or traced, as their condition or prerequisite. It is argued that the soul and body are one material organism, because we know that in many instances some affection of the one is necessary as the condition of a correspondent affection of the other. The soul cannot see unless the retina is painted by the light, nor can it hear unless the ear vibrates through sound. Hence it is inferred that the one is the effect of the other; and if the soul is acted on by material or organic causes, it must be material in its substance or structure. It ought greatly to weaken the force of this argument, to observe that the change in the soul is in its nature wholly unlike the conditions which go before it. The impression on the eye or the ear has no affinity with or likeness to the perception which follows. Moreover, the condition in the organism often is a condition simply and solely as it furnishes an object which the soul apprehends, and determines nothing in the result, except so far as it gives the soul an occasion to know one thing or object rather than another; *i. e.*, the eye sees rather than hears, and sees this object rather than another, because the excited organism furnishes the occasion. But the conclusiveness of the argument is entirely broken, when we reflect that no changes in the organism whatever are known to precede or to condition the most numerous and the most important psychical states and affections. We grant that the landscape which we see must first be pictured on the retina. But what change or affection of the material organism occurs, when the soul, at the sight of this landscape, images another like it, calls up by memory a similar scene, which was seen years before a thousand miles distant, or, by creative acts of its own, constructs picture after picture that are more beautiful and varied than the one it is beholding? Or what bodily changes precede desire and disgust, how

and fear, at these memories and creations? No such changes have ever been discerned. No ground is furnished for surmising that they ever occur. They must occur in every instance, to justify *the theory* of the materialist. That they do occur, is simply assumed. They have never been observed.

The argument of the materialist stands thus: Certain psychical states or processes require as their condition certain organic bodily affections. These bodily affections, however, are totally unlike the mental states which they conditionate. In every case in which they do occur, they present new objects of apprehension and feeling. By these, and by these only, the soul receives its knowledge of the material world. Certain other mental states, far more numerous and far more important, are attended by no affections of the body whatever. Which, then, is more philosophical, to assume that such organic changes do occur when we cannot trace their presence, nor any appearance of an organ in which they might be traced, or to which they might be referred, because, forsooth, they do occur when we can trace them, and can give the reason for their occurrence; and then, with the aid of this unauthorized assumption, to infer that the soul and body are one organism;—or to disbelieve that such bodily changes do occur as the conditions of mental activity, when we have no evidence from observation and no presumption from analogy?

Gradations of existence do not prove it to be material.

5. The regular gradation in the arrangement of the several kinds of material existences, and the progressive development from the lower to the higher forms of organized matter, do not of themselves prove that the soul is matter in a more highly organized form. Nor does the fact that the transition from the highest forms of organized matter to the lowest types of psychical activity cannot be readily discriminated; nor that the body, which is organized for the uses of the soul, seems in its development to assume in successive order all the lower types of organization, force us to believe that a common substance, obeying material laws, is capable of rising into that refinement of organization which can perform the functions of knowledge and affection.

These facts can only be regarded as proof by the man who assumes that the existence of immaterial or spiritual being is impossible, and the belief of it is unphilosophical. This assumption involves the inference that there is no spiritual Creator, on whom matter depends for its existence, properties, and laws. If there be a creating Spirit, who originated and controls matter, then it is not unphilosophical to believe that there may be a created spirit, which is intimately connected with and affected by a material organism, or which, perhaps, is itself the organizing agent.

To those who assume that there can be no extra-mundane or creating Spirit, it is useless to attempt to prove that there may be an incorporeal, created spirit.

To those who admit that there is or may be a creating Spirit, or even to those who believe that design has a place in the universe, the regularity of development and progressive transition from one being to another will indicate a unity of plan in the creation more clearly and

more satisfactorily than they will prove a unity of material substance in the agent—a unity of purpose and intention in the order and beauty of these arrangements, rather than a unity of nature and destiny in the lower and higher kinds of beings.

It may be impossible for us to draw the line where material organization ends and spiritual agency begins, where unconscious reaction ceases and conscious activity emerges. It may be impossible for us to discover the properties and relations of organized matter which fit it to be the instrument or the medium of the soul, or what there is in the soul that fits it to be developed with and to employ this organized substance. But we do know enough about spirit and matter to affirm that if spiritual existence is possible, and if it be necessary from its constitution or important to its destiny that it be developed with or organize matter, then all those phenomena by which it seems to rise by a natural evolution from the higher forms of matter, and to crown the series which it terminates, as "the bright consummate flower," are fully explained by the unity, the beauty, and the harmony of the Creator's plan, and do not require to be resolved by a unity in the substance which they manifest.

This is all that we need determine at the present stage of our inquiries. What is the substance and what the destiny of the soul, can be fully defined and vindicated by the philosophy and theology to which psychology is the appropriate introduction.

§ 22. It is important to remember, however, whatever views we accept of the nature of the soul, that its phenomena are as real as any other, and that their peculiarities are entitled to a distinct recognition by the true philosopher. Whatever psychical properties or laws can be established on appropriate evidence, they all deserve to be accepted as among the real agencies and laws of the actual universe. Perception, memory, and reasoning are processes that are as real as are gravitation and electrical action. In one aspect their reality is more worthy of confidence and respect, as it is by means of perception and reasoning that we know gravitation and electricity. Their peculiar conditions, elements, and laws, so far as they can be ascertained and resolved, are to be judged by their appropriate evidence, and to be accepted on proper testimony. The evidence and testimony which is pertinent to them, may be as pertinent and convincing, though different in its kind, as that which can be furnished for the facts of sense or the laws of matter. If the soul knows itself, its acts, and products, by a special activity, then what it knows ought to be confided in, as truly as what it knows of matter by a different process.

§ 23. The analogy of the physical sciences establishes this principle, and enforces it as a universal rule. Facts of one sort are not to be distrusted because they differ in kind or quality from those of another class. Truths of one kind are not to be measured by truths of another. Phenomena of one description are not to be solved by laws that hold good of other phenomena. Chemical facts and laws are not disputed because they cannot be explained by mechanics.

The phenomena
of the soul real.

Phenomena of
one sort cannot
be judged by
those of another.

properties and powers. The functions by which the plant is nourished and grows are not to be doubted because they cannot be explained by the laws which regulate the rise of water in a pump, or those which unite an acid or an oil with an alkali, into a salt or a soap. Nor are the circulation of the blood, or the digestion of the food, to be questioned, or violently explained by laws which do not solve them, because they exhibit special and novel agencies, and must be interpreted by peculiar methods. We are indeed prompted—we are even compelled—to reduce all our knowledge to unity, and we therefore seek to explain two events and two classes of phenomena, if it is possible, by a single agency and after a single law. We must prefer the well-known and the familiar to the unknown and the untried; but if we do not succeed, we may not for this reason doubt the facts or pervert and misconstrue the laws. If, now, there are phenomena concerning man which are discerned by consciousness alone—if also their truth can be established only through consciousness—then they are to be received as real, whether they are or are not like the phenomena of matter, or whether they can or cannot be explained by the laws or analogies which material phenomena illustrate and exemplify. To deny them, is unphilosophical. To attempt to explain them by any resort to physical analogies which fail to solve them, and which destroy their integrity or essentially alter their character, is to be more unphilosophical still. If either class of phenomena should take precedence of and give law to the other, the spiritual are before the material, for the reasons which have been already given.

The phenomena, and language in which they are described.

§ 24. We ought also to distinguish between the powers and laws which consciousness discovers, and the medium by which these discoveries are recorded and made known. This medium is language, in the large acceptation of the term—the language of signs, of looks, and of words. The most superficial inspection of the words which describe the thoughts and feelings, reveals the fact conclusively that they were all originally appropriated to material objects and to physical phenomena. The words *perceive*, *understand*, *imagine*, *disrupt*, *disturb*, *adhere*, and a multitude besides, were all originally applied to some material act or event. It is only by a secondary or transferred signification that they stand for the states or acts of the soul.

“It may lead us a little toward the original of all our notions and knowledge, if we remark how great a dependence our words have on common, sensible ideas; and how those which are made use of to stand for actions and notions quite removed from sense, have their rise from thence, and from obvious sensible ideas are transferred to more abstruse significations, and made to stand for ideas that come not under the cognizance of our senses; e. g., to *imagine*, *apprehend*, *comprehend*, *adhere*, *conceive*, *insult*, *disrupt*, *disturbance*, *tranquillity*, etc., are all words taken from the operations of sensible things, and applied to certain modes of thinking. *Spirit*, in its primary signification, is breath; *angel*, a messenger; and I doubt not but if we could trace to their sources, we should find in all languages the names which stand for things that fall not under our senses to have had their first rise from sensible ideas.”—LOCKE, *Essay*, B. III., c. 1, § 4

A more profound inquiry into the history and etymology of particular languages shows beyond question that the radicals and many primitive words were first applied to sensible objects

A careful study into the grounds of this fact, universally observed, will show that it could not be otherwise. How could one mind first communicate with another, except by some sensible sign common to both? To such a sign the speaker must direct the eye of the hearer, after which it could stand before both as the common representative or symbol of the thoughts of the two. It is not easy in all cases to decide what determined the selection of this or that physical image to represent a particular act or state. Even when the same image is used in dialects and languages that are remote, it is sometimes difficult to ascertain what affinity it has for the spiritual object. But the facts are unquestioned. In many cases the physical image is forgotten, and has passed out of view. But in many others it is more or less forcibly suggested whenever the word is used, and it often so obtrudes itself as to mislead and confuse the conceptions and reasonings which are applied to spiritual objects.—Cf. K. F. Becker, *Das Wort in seiner organischen Verwandlung*.—§§ 77–80.

Misleading influence of language.

§ 25. The physical analogon which led to the selection of the word often lurks behind its psychical import, and is ready suddenly to spring out before the eyes, and not unfrequently to suggest erroneous and mischievous conclusions. Let the word *impression* be used, as it naturally is, for some affection of the intellect or the emotions, and it is not unlikely that it should be conceived and reasoned of as involving some pressure or impulse. A mental *image* is taken to be a literal drawing or picture that is painted on the 'presence-chamber' of the soul, or can be restored or re-illuminated by the memory. The objects of the external world are said to be *out* of the mind, while the image or remembrance is said to be *in* it; as though the soul filled a portion of space, and disposed its thoughts within its walls or limits. The memory is conceived as a storehouse of facts, dates, or principles, all ready to be taken down or drawn out when required. Consciousness is thought and reasoned of as though it were an inner light, which illumines by its radiance the dark and winding recesses of the world within. Conscience is the voice of God, speaking with the distinctness and authority of audible speech.

When we reflect on the import of such terms in their application to the soul, we readily assent to the proposition that they are metaphors, either fresh or faded. But we do not always observe, nor do we always guard against the insidious influence of the image from which the metaphor was taken. When we are occupied with the thought, and not with the word—when we are reasoning earnestly, or seeking a solution which evades us, the material image will supply a suggestion which is more plausible than valid, and it will lead us to a conclusion which is both foolish and false. In such cases we reason and infer, not from what we know, but from what we say; and the very language which we use to define and steady our thinking, confuses and distracts it. Inasmuch as all the language which we use is material in its origin and structure, it will incidentally favor all those views of the soul which are materialistic, either as professed theories or insensible associations. The superficial thinker will press the physical senses of the words which he uses into the service of his theories; the careless thinker will be imposed upon by the physical associations which the words suggest. When difficulties or even contradictions are suggested by the physical sense of the language employed, they will embarrass and disconcert the thinker who does not reflect that they spring from the representation of the phenomena by language, and not from the phenomena themselves. Thus, it may be urged. How can the soul act at a point where it is not present? How can it feel, if an impres-

sion is not carried to its portal? How can it originate, without itself being moved? How can it be conscious of its states, without having first experienced the state of which it is conscious? The physiologist, in attempting to explain the phenomena of sensible perception, as he passes the mysterious line which divides the affection of the organ from the action of the mind, is tempted to carry with him material conceptions, by the very force of the language which he utters, and to find an argument for the truth of these conceptions in the very language which he is forced to employ. Indeed, the history of psychology is a perpetual testimony to the truth, that materialistic conceptions and theories find their readiest justification in the terms which the most thorough Spiritualist is forced to employ, and that a quasi-materialism seems to spring out of the very language by which it is confuted. Hence it becomes so important that the conceptions which we form should be sharply distinguished from the language in which they are uttered; and that the student of psychology should place himself ever on his guard against the influence of the images and associations which are continually put into his mouth by the language which the necessities of his being force him to use; which language, however high it may soar into the spiritual, can never free itself from the matter in which all its terms have their origin.

THE RELATIONS OF THE SOUL TO LIFE AND LIVING BEINGS.

The considerations already presented are sufficient to prove that the soul is not material in its structure. But its relations to organized or living matter require a more careful analysis, if we would do justice to all the questionings of modern physiology, and conduct our inquiries in a thoroughly scientific spirit. In order to determine these more subtle relations of the soul to life and living beings, we need first to ask "What is life, or what is a living being?" and next "What are the relations of the soul to life?" These questions have been often asked, and variously answered. Recent investigations and discussions have invested them with special interest and importance.

1. *Life and Living Beings.*

Material things or beings are readily and universally divided into the two classes of organized and unorganized, and the matter of which each is composed is distinguished as organic and inorganic. In unorganized beings, the material constituents are combined according to the ordinary laws of mechanical and chemical union into homogeneous substances. Organized beings, on the other hand, are heterogeneous, i. e., they are made up of parts which are unlike in structure, form, and function. Even of organized beings the lowest forms are divided into parts called organs, to each of which is assigned some function or operation which is shared by no other, and which is essential to the existence of the whole, and to the action of each of the parts. A being so constituted is an organized being, or an organism, and its matter is called organic. An organized being, when in such a condition as to be capable of performing its functions under its appropriate conditions or *stimuli*, is a living being. The condition itself is called *life*.

So far all parties agree in their definitions and theories. But as soon as the question is raised, on what does this peculiar condition depend, or what produces and sustains that form of existence and action which is organic and living, we find that philosophers in ancient and modern times differ greatly in the answers which they give.

Among the ancient philosophers the atomists explained life by the fortuitous mixture of atoms, acting by the mechanical laws which were by them rudely conceived and defined. A very large number, however, accounted for these phenomena by a separate agent, called the soul, which, alike in plants and animals, was thought to be the cause of the organic structure, and its organic functions. In the higher forms of being, as in man, this soul or vital principle was supposed to attain to certain emotional and intellectual functions. As the capacity for the highest functions, it received another appellation, and in the opinion of Aristotle, as he is generally interpreted, this higher nature, the *Noûs*, was in some way added to the lower forces, and qualified to maintain a separate existence, after the destruction of the body.

Plato taught positively, though in mythical language, that the soul is pre-existent to the body, and immortal in its duration; that it is ethereal in its essence, opposite in every respect to the matter to which it is reluctantly subjected, and which soils its purity, obscures its intelligence, and weakens its energy.

The distinction of body, soul, and spirit, *σῶμα, ψυχὴ, πνεῦμα*, is sanctioned by the writers of the Old and New Testaments, and was adopted by the early Greek fathers as being psychologically exact and of great scientific and theological importance. A few writers made the *πνεῦμα* of the New Testament coincident with the Platonic and Aristotelian *Noûs*, and the *ψυχὴ* equal to the vital and phantastic soul or the latter only—reserving the *σῶμα* for vitalized matter, or else making the *πνεῦμα* to be the vitalizing principle.

In modern philosophy, in consequence of Platonic and Christian ideas, and under the influence of the philosophy of Descartes, the soul has been more sharply contrasted with matter and extension in all its forms. As a natural result, the soul, as the principle and agent of the higher functions, was separated from the agent of living, organized matter, or the principle of life. Under the influence of the new philosophy, —the mechanical philosophy of Descartes and of Newton,—the question, what is the living principle, assumed a new interest. With the progress of modern anatomy and physiology, the mechanical structure of the skeleton came to be more perfectly understood, and the adaptation of the form and adjustments of every one of its parts to the communication of force and the direction of motion, familiarized and deepened the conviction that the human frame in its structure and activities, may be explained by mechanical relations and laws.

The discovery of the circulation of the blood by the contraction and dilatation of the heart, and the connection of these movements with the expansion and contraction of the lungs, called the attention of physiologists more distinctly to the presence of mechanical agencies in functions where their presence had not been suspected. The somewhat recent discoveries of modern chemistry, that many of the most important vital functions, as respiration, assimilation, and excretion, are attended by, or result in the composition and decomposition of chemical elements, according to chemical laws, have led many to contend that the existence of the organs themselves, and the combination of them into an organism, are to be ascribed almost entirely to chemical agencies, and that life itself is but an abstract term for the conspiring activity of manifold subtle mechanical and chemical forces. Whatever is peculiar in the origination, structure, and functions of living beings, it is believed by many, can be accounted for by the operation of the mechanical and chemical properties of matter in obedience to their well-known laws, acting under special conditions.

This theory is rejected as unsatisfactory by very many eminent physiologists and physiological chemists. They contend with equal earnestness that the phenomena peculiar to living beings cannot be explained without the supposition of some additional property or agent, which is essential to their formation and preservation, as well as to the performance of many of their peculiar functions.

This agent, cause or force, has received various appellations. Blumenbach calls it the *nervus formativus* or *Bildungs-trieb*; John Hunter the *vital principle*; William Prout, the *organic agent*, the distinguished John Müller, the *organic force*. It is more usually called the *vital force*. Schmid of Dorpat terms it somewhat carefully the *transmutating cell power*, and Bischoff, of Munich, defines it as “the peculiar and individual cause or force which creates and shapes the whole body, and manifests psychical qualities by means of the brain,” thus blending the vital and psychical force in one.

In support of the opinion that there is such an agent or force, the following reasons are urged:

1. Every living being originates from a being that is already organized or living. No well authenticated account has been given of the production of the lowest form of life in any other way. No experiment has ever been successful which had for its object the origination of a living being from elements that were not already living.

Even those substances or things of which we can hardly say whether they are or are not living, are produced from an existence like themselves, or from some seed, cell, spore, or organized portion of matter that has the same kind or degree of life. Without going back to the first beginning of things, or raising any questions about subsequent acts of creation, we find the fact unquestioned, that the existing world of nature is divided into organized and unorganized matter, and that, while the organized depends on the unorganized for the conditions of its existence, and when these conditions fail is resolved into it again, it has yet never been known to originate from this alone. This fact or law widely extended and universally prevalent, indicates, if it does not prove, that living beings depend upon a force and obey laws which to some extent are peculiar to themselves.

Huxley concedes this fairly and distinctly—“I need not tell you,” he says (*Origin of Species*, III.) “that chemistry is an enormous distance from the goal I indicate. * * * It may be that it is impossible for us to produce the conditions requisite to life; but we must speak modestly about the matter, and recollect that science has put her foot upon the bottom round of the ladder. Truly he would be a bold man who would venture to predict where she will be fifty years hence.”

If life were but another name for a peculiar combination and activity of mechanical and chemical forces, we might presume that somewhere and at some time, these had been, or might be combined as to produce living beings or the germs of the same, and that in the lowest or more elementary forms of life there would be some suggestion or semblance of such origination. But neither observation, experiment nor history give record, or hint of such an occurrence. The belief in its possibility is a matter of

pure inference. The doctrine of the evolution of the organic from the inorganic, as held by Darwin and Herbert Spencer, is founded on a special metaphysical theory, resting on analogies violently strained from observed facts, but not confirmed by a single observed event, or *experimentum crucis*. The only evolutions and developments actually observed, lie respectively within the spheres of the organic and the inorganic. The one sphere has never been evolved or developed from the other.

In view of these facts, and even the analogies which they suggest, there is little force in Spencer's confident assertion, founded on mere metaphysical romancing. Though he applies his remark to the evolution of one organism from another, yet he would extend it to the evolution of the organic from the inorganic. "If instead of the successive minutes of a child's fetal life we take successive generations of creatures—if we regard the successive generations as differing from each other no more than the fetus did in successive minutes, our imaginations must indeed be feeble if we fail to realize in thought the evolution of the most complex organism out of the simplest. If a single cell, under appropriate conditions, becomes a man in the space of a few years, there can surely be no difficulty in understanding how, under appropriate conditions, a cell may in the course of untold millions of years, give origin to the human race."—*Principles of Biology*, § 118.

2. The process of nutrition or growth is peculiar in respect of its material and method of assimilation, neither of which can be explained by mechanical or chemical forces or laws.

The living being is composed of material constituents, it has chemical and mechanical properties, and to a certain extent obeys the laws which these properties involve. As it adds to its substance by nutrition, and increases its size by growth, its aliment possesses material properties and obeys material laws. But while the aliment, the process and the product, all show these properties and comply with these laws, neither these actions nor their results exclude the coöperation of another force. Nor, again, does the belief in such a force require us to believe that it produces effects not evident to the senses, or that it manifests its presence and power in any way except by controlling and modifying the action of the lower forces.

That these forces are so controlled in nutrition and growth, is evident from the general fact that nutrition and growth can only be expected from an aliment which has been already modified by the action of some living being. The fact is now well established, that the food of every species of animal life, the lowest as well as the highest, must directly or indirectly be prepared for assimilation in the vegetable kingdom. The chemical materials which enter so largely into its substance cannot be appropriated in their inorganic condition from the earth, the air, and water in which they abound. The beginning of all nutrition is in vegetable life, and the beginning of vegetable life is in the vegetable cell. But this, it would seem, must directly assimilate its chemical constituents, so that in the last resort, it might be urged, we find the organic feeding on the inorganic. On inspection of the cell, however, we find that it begins to exist with its food already prepared. The living being—the cell—not only owes its existence to another living being, but it derives from such a being the food by which it is to be nourished, which food is in a certain sense living. So soon as it exists as an organism, it exists with its, so to speak, organized aliment—an aliment affected by the action of a force peculiar to the organism. Its growth depends upon the preparation of its food as well as upon the process of assimilating it to its substance. The food of both animal and vegetable, though chemical in its constitution, is also organic or partially organized.

Without insisting on any thing that is in dispute, or is yet undetermined among chemists and physiologists, as to the peculiarity of the compounds that are formed in organic assimilation, or the laws of their formation, without even insisting upon the catalytic process, which is peculiar to organic beings, we are content to contrast the formation of the crystal with the growth of the animal and vegetable cell. The liquid in which the crystal-nucleus is placed, and from which it is formed, has certain chemical ingredients, which neither itself nor any other nucleus has any influence in providing or preparing. It surrounds this nucleus, to the external walls of which certain of its elements are attached by mechanical adhesion in regular forms. The wall or coat of the animal or vegetable cell, on the other hand, is an agent that strains and secretes aliment through its substance and brings it within its limits, making it a part of itself. When it has prepared it for use, it proceeds to assimilate it to itself. Its growth is not, however, a mere enlargement of bulk by accretion of new matter to the individual cell already in being. It can only grow as it prepares new cells, each like itself in structure and function, and adds them to itself by the closest union. The cell—the beginning of life—not only begins with an aliment prepared, but with the capacity to produce another cell, and by this production it grows. This process of growth, though involving mechanical and chemical processes and results, is a process wholly unknown to the mechanics and chemistry of other kinds of matter, and cannot be accounted for by such processes or laws either singly or in combination.

In all other combinations except the vital, the result or product is purely mechanical or chemical, and is distinguished by mechanical and chemical attributes. These may be unlike those of the constituents, but they are clearly like them as being mechanical and chemical, and nothing more. The properties of a neutral salt, though unlike, and perhaps opposed to those of either of the constituting elements, still obey mechanical and chemical laws, and produce effects which are appropriate to these modes of action. It

the organic product the result is an agent capable of a function or mode of action peculiar to a living being, a function which can be said to be chemical or mechanical only so far as it deals with material substances, and controls their properties in a manner peculiar to itself. Thus the lungs, the heart, and the brain have definite chemical constituents, perhaps the same or perhaps not the same in each. But the product in each is an organ capable of a special and unshared function, which controls and modifies the mechanical and chemical properties of inorganic being, but is not itself for that reason a mechanical or chemical agent.

3. Growth in a living being proceeds after a definite plan, and is adapted to the end of the individual and the species. This adaptation applies to the structure, form, and proceeds after a function of every part and organ.

Inorganic accretions are homogeneous in respect to material, figure, and properties. With a given nucleus and a given material, the union is of the same to the same, and the product, so far as structure is concerned, is similar in all its parts. The form is determined by some mechanical agency, which is purely accidental, and hence such substances are, with one exception, said to be formless, i. e., without determined form. In the crystal, with homogeneity of structure, there is definiteness, and to a certain extent, variety of form. But the symmetrical variety in the species is accounted for by the law of polarity, determining a special mechanical structure in a special chemical material. Deviations in the individual from the form of the species, are referred to some disturbing mechanical influence, which arrests or impedes the production of the completed form.

But in organic growth the structure is heterogeneous. The several parts, i. e., *organs* of a plant or animal are more or less unlike in their chemical constitution, though they are fed by the same aliment.

They are still more unlike in form. The root, the stem, the bud, the bark, the leaf, the flower of every plant, the external members, and the internal organs of the simplest animal, are unlike each other, even to the halves of the same pair. The wholes made up of these parts are unequal in size in each individual. There is nothing in the action of any known mechanical or chemical forces to indicate or account for this diversity, which is constantly repeated, and runs into every minute and subordinate detail.

These several parts are not only diverse in their structure and form but they are also diverse in their functions. To each is assigned a duty which is peculiar to itself and which no other does or can perform.

But each part though diverse and peculiar in each of these particulars is adapted to every other in each; to the structure, the form, and function of every other, which all together are adapted to the form, material and sphere of existence of the whole which these parts compose. Each part has a form not only more or less adapted to the successful discharge of its functions, but also to the form of every other part, so as with it to make a whole which shall be convenient for its uses and perhaps distinguished by beauty and grace. The function of each organ is adapted to act with the function of every other, in such a way that the continued existence of the whole is maintained; and the well-being of the whole in its turn promotes the well-being and successful action of the parts.

This growth after a plan is peculiar to living or organized beings. In the known operation of mechanical and chemical laws there is nothing which secures such a development or result. The plan involves more than the perfection of a single individual; it contemplates the production of several individuals of different characteristics before the cycle is completed and ready to begin anew. Should the possibilities of development within the sphere of living beings be proved to be greatly extended, as far as the most extravagant theorists contend, it would only increase the mystery of life, because it would enlarge the complexity of the plan which the living force tends to complete, and of the destiny which it is able to fulfil. The egg of the winged moth, or butterfly, includes in the plan and destiny of its being capacities to be developed into and through three forms of existence. This does not set aside the truth that the egg is developed after a plan, but rather confirms and enforces it.

4. Living beings are still further peculiar, in that their existence and growth involve a constant change of material in consistency with integrity of being and sameness of form. Combinations purely mechanical and chemical, when completed, remain, or if there is any action or reaction in the material, they are attended with change of structure or alteration of form. But in a plant or animal, the whole or large portions of their substance are changed in a longer or shorter period, while the form is unaltered, or if changed it is enlarged after the original pattern. While gradual and often unobserved changes of structure are going on, the functions of each part are not in the least interrupted.

5. Organic beings are very largely susceptible of repair. A carious bone may be hollowed out, and yet, if the *periosteum* remains entire, the cavity may be filled by a second growth. The paws of the salamander may be cut off, and the whole be restored after the pattern of the first. The bones, twenty or more, the skin, nerves, muscles, and vessels, all will be reproduced in as perfect adaptation as in the original. (*Fleming, De la Vie et de l'Intelligence, P. I., sec. I., c. 3.*)

No phenomenon like this is known to chemical and mechanical forces or their laws. These features, all of which are more or less conspicuously manifested in all organic and living beings, have led many of the most eminent physiologists to the conclusion that there is an organic or vital force

in every living being. Such a force must from its nature be an individual force, possessing, indeed, the common characteristics which we have noticed, but maintaining in each an activity which begins and ends with its individual existence. In this respect this description of force is strikingly contrasted with all known activities of general physical laws. A mechanical force can be imparted and withdrawn, again and again, to and from, the same mass of matter. Its parts can be separated and again be compressed and united so as to restore its integrity. The same chemical elements can be combined and decomposed into substantially the same product, with the same particles, in the same form, and capable of similar functions. But a living being, when its integrity is destroyed, can never live again. Should the same particles be again united in an organism it would not be the same being. Its individuality is indicated by beginning with a germ, maintaining continuous nutrition, and discharging uninterrupted functions.

Opposite views stated and defined.

The conclusion which we have reached, that there is a separate vital principle or force is rejected by many philosophers and physiologists. Those who hold that the soul is material in its composition, must of necessity reject the view that there is a separate principle of life. Those who account for the existence of the higher forms of being in matter, life and spirit, by a preconceived theory of evolution of the higher from the lower, are precluded by the necessity of their metaphysical theory from accepting a vital force. We may properly leave the views and arguments of both these classes unconsidered and notice the more plausible reasons which are urged by many eminent physiologists of other schools.

The view which they hold in common, under a great variety of special diversities of opinion, may be expressed in the following proposition. The terms *life*, *living*, &c., are general and abstract expressions for a great variety of powers and processes, which are proved or may be presumed to be chemical and mechanical. The fact that these processes and powers are so very peculiar in their phenomena and their products, is to be accounted for by the special combinations or special conditions in which they act. Thus Carpenter defines life "as the state of action peculiar to an organized body or organism." He contends that there would be no objection save the probability of its abuse to the employment of the terms "Vital Principle," "Nexus Formativus" or "Organic Force," as convenient names for the unknown powers which are thus developed.

Rieherand defines life as "a collection of phenomena which succeed each other during a limited time in an organized body." De Blainville says: "Life is the twofold internal movement of composition and decomposition at once general and continuous." "Life," according to Mr. G. H. Lewes, "is a series of definite composite changes both of structure and composition which take place in an individual without destroying its identity." Herbert Spencer, after several tentative definitions, concludes with this: Life is "the definite combination of definite composite heterogeneous changes, both simultaneous and successive, in correspondence with external coexistences and sequences." R. Virchow makes "the vital force to be the expression of the definite co-working of physical and chemical forces." Lotze, the distinguished physiologist of Göttingen, says, that "living functions are not simply forces but capacities for functions which arise out of the special method of conjoining material particles into a coherent system." All life, in his view, depends "on the complicated relations under which the physical powers act as an organism."

Carpenter's illustration and argument.

As a general argument in support of his views Carpenter uses an illustration which we presume would be accepted by all who reject a "vital force." "We shall suppose a young physiologist, entirely ignorant of physical science, but educated in implicit faith in the vital principle, witnessing for the first time the action of the steam engine." "He would observe a machine of various parts, would try various experiments, would perceive that the actions are as unlike as the parts, and all tend to one result." "Hence he may safely conclude that the whole series of phenomena is due to one presiding agency—a 'steam engine principle,'—by the operation of which upon the material structure, its actions are produced and made to harmonize with each other and with their ultimate object." In our view no example could possibly be employed which is better fitted to refute the theory of Dr. Carpenter, and establish the opposite, than is this very illustration. The reason why it is absurd to accept a "steam-engine principle" in a steam engine, and not absurd to accept a vital principle in a living being, is that a careful study of the parts of the machine which are alleged to be analogous to the organs of the body, reveals the operation of forces that in other connections are familiarly known in their laws and their products. There is nothing new in the action of the separate parts of the engine when separate and when combined in whole. Each part, as a part, only does what we have often observed in other cases. The joint action of many of the parts, their conspiring, correcting and modifying movements, is just what we should predict if we had analyzed those several forces and carefully computed their result. We reject the steam-engine principle by the law of parsimony, because no such force is needed to account for the result. We accept the vital principle because no known force or function is adequate, or may be fairly presumed from analogy to be adequate to the result. The nature of heat, its power to generate steam, the elastic force of steam, the means of producing it, the various devices by which it can be introduced and displaced, the methods of converting the direct motion into the circular, are all familiar in other connections. If a single phrase or term is used for their combined action as directed to one result, such a term 's at once

understood to be nothing more than an abstract expression for the conspiring activity of well-known agents. If the illustration were pertinent to the vital force, and established Carpenters doctrine, it ought to be possible to analyze the living body into certain organs, each possessed of well-known powers and acting after well-known laws, and producing or tending to results that each fully and clearly accounts for. But this is not possible. There are separate organs, each endowed, it is true, with certain mechanical and chemical properties, but these organs, with all these capacities and tendencies to action, do not in their combination explain the functions nor define the conception of a living being. It is because these properties are modified and controlled to functions and results unknown in any other connection that we ask what is the power which controls them. It may be said that they overrule and control one another, or that they act with or against one another, and so the result follows and this co-action or counteraction of such known forces is life. To this we have only to rejoin that we cannot trace the result to the known joint or counter action of one force with another. There is nothing in the nature or tendency of these forces supposed when acting alone which would lead us even to suspect that such results as those in question would follow when they act in conjunction.

We allow, as has been already said, that chemical and mechanical properties and laws are present in a living being, for we trace their presence and measure their action; but inasmuch as this action is controlled by some agency other than their combined action, so far as known to us, we are compelled to ask, What is that agency? We are driven back to the necessity of assuming that there is an agency or force which is distinct and separate from the combined activity of forces already known.

Under the pressure of this difficulty, those who reject a vital force adopt one of two expedients. They either assert that the special combinations of mechanical and chemical elements which occur in living beings develop capacities before unknown and unsuspected, because undeveloped, or they find in the special circumstances and conditions of living beings a sufficient explanation of the development of these before unknown capacities, in the new form of vital processes and phenomena. In respect to both they reason, that though there is no decisive evidence that these new combinations of forces or the special conditions of their action do develop these special mechanical or chemical agencies, yet the probability that they do is so overwhelming as to stand in place of a demonstration, until the contrary has been shown to be impossible.

Thus M. J. Schleiden reasons, "It is certain that chemistry has solved many questions in respect to life by means of the same laws which operate in inorganic bodies; that no one doubts that electricity and galvanism affect organic beings; these are with all bodies subject to the laws of gravitation, cohesion, adhesion, &c., &c. Nor do we as yet know the limits of the efficiency of any one of these forces in organic beings. Conceding that there were a special vital force, so much is clear, that we ought not to speak of it until not a doubt remained that we had fully investigated to its extreme limits the sphere of the efficiency of all the organic forces in organic beings. Then only could we be in a situation to determine with absolute certainty whether, of that whole which we call life, a greater or smaller portion remained which could not be referred to inorganic agencies. Thus, and thus only, could we reach a vital force."—(*Grundsätze der wissenschaftlichen Botanik. Leipzig. 1843.*)

In the same spirit Lotze urges that the necessity of resorting to a vital force can only be demonstrated by first exhausting every conceivable experiment and theory which supposes the possible operation of mechanical and chemical laws. While he candidly concedes that no experiments prove this, he dogmatically advances the theory that there may still be certain points of affinity and action between inorganic agencies, which, if known, would fully explain the vital phenomena.

Of these suggestions of possible modes and conditions of action, we can only say that if there are no indications of such modes and conditions, it is unphilosophical to believe them. To do so would require a course of induction that would set aside the force of the methods of agreement and difference, neither of which could prove any thing against the possible suggestion of unknown and unindicated methods of action. The simple fact that these lower forces are known to be present in organic beings, and to be effective of certain results, suggests no more than the bare possibility of their activity to other and even to vital effects, but if possibility does not ripen into evidence by positive tests, it must be set aside. The fact that these agencies, as Schleiden intimates, have explained certain vital phenomena before deemed inexplicable, signifies no more than that we now trace their presence further than we had suspected it; but it does not in the least account for the peculiarity of certain other effects which chemistry and mechanics can in no way explain.

But it is urged that an analogous fact is furnished in the formation of many chemical compounds—as when certain neutral salts exhibit properties of which the constituents gave no intimation; and when ingredients that are mild and harmless do, as soon as they are combined in certain proportions, produce substances that are acrid and destructive. To this it is replied, that the new properties or activities, though unlike those of the constituent elements, in certain respects are like them all, in so far as that they are still chemical properties. They do not belong to an entirely different sphere, as do the vital powers. The properties of the chemical substances are not only chemical, but they are permanent and fixed. Those of the vital organism are not only peculiar in their nature, but capable of variations and progress. The rudiment of life in the animal or vegetable, on the other hand, is not fixed, but is capable of change and development; it is even potential of the whole organism. The living cell is

Two other expedients resorted to.

Not enough that they are possible.

not only organized, but *organific*, as it is capable of growth and development into new organs, with peculiar and as yet unknown and unused functions.

Moreover it can be demonstrated that animal cells which have precisely the same chemical composition, and are precisely similar in every other property, are developed into animals of entirely different species. This is true not only of the cells of different species of certain infusoria, but of the cells of larger animals belonging to the same genus, which exhibit, when developed, striking diversities of size, form, &c. One cell or germ of given chemical constituents, say of a mouse, is not only *organific* of a product of a given form, size, functions, &c., but another cell of the same constituents produces another product, differing in form, size, and functions, say an elephant.

Supposed special conditions.

Those who do not accept the argument *ab ignorantia* which we have described, or who will not rest their cause upon the general probabilities to which we have referred, seek to find a decisive reason for the diverse character of the inorganic and organic phenomena in the peculiar conditions to which the agencies are subjected, which they contend are common to both. Some explain the development of the organic from the inorganic by heat. Some resort to light as the sufficient cause for the evolution of matter into life. But heat and light, though both are essential to growth and life, cannot be shown to be the originators of the capacity for either in a substance that under every variety of either and of both, may remain inorganic and dead. Others contend that at certain periods of existence, the inorganic materials might have been more sensitive to these agencies, and so the agencies themselves have become almost creative. But these are mere conjectures of what is possible.

Organization resorted to.

Others resort to *organization* itself, as furnishing the required conditions under which these chemical and mechanical agencies manifest vital effects. Thus Carpenter says: "We find nothing, then, in our fundamental idea of matter to oppose the doctrine that vital properties are developed in it by the very act of organization." "For no one can assert that there does not exist in every uncombined particle of matter which is capable of being assimilated, the ability to exhibit vital actions when placed in the requisite conditions; in other words, when made a part of a living system by the process of organization." "The process of organization" and "the capacity of being assimilated" are phrases which include the very thing to be accounted for and defined. What is organization, is the very question which needs to be answered. Is it or is it not a peculiar combination of material particles which enables their mechanical and chemical properties to evolve and exhibit vital phenomena? The capacity of matter to be assimilated, what is that? To say that the reason why material particles, when united, pass into a substance which is alive, is owing to the fact that a living being assimilates them, and they are capable of being united to its substance, is to overlook the question to be answered, which is, what is the force which organizes? Herbert Spencer, in a similar way, takes refuge in the phrase *physiological units*, after being forced to reject *chemical* and *morphological units* as inadequate. (*Princ. of Biology*, § 66.)

Also Creative Power.

Nor does it relieve the difficulty to say, with Carpenter and Lotze, that it is competent for the Creator only to organize material particles into a living being. The question still remains, What is it to create or originate a living being? What is a living being when it is created? What does the Creator perform, and what is the product of his act? Does he simply develop capacities which were latent in mechanical and chemical attributes, or does he give to some of these particles a new force which is capable of organizing matter into life, and of propagating life? Is life the cause or is it the effect of the organization of matter?

The special conditions sought for are supplied by some in the brain or nerve power. But brain or nerve power, if it means any thing more than the sum total of the particles of which the brain and nerves consist, must mean the same as organized particles or organizations. With this interpretation of the phrases, the original difficulty returns with all its force.

Vital force admits of decay.

The objection is sometimes urged, that if life means any thing more than material particles specially coordinated and combined, there could be no possibility of the decay or extinction of life. If life modifies and controls other agencies, these agencies cannot be injurious or destructive to life—which is contrary to the facts of experience. To this it is sufficient to reply that the doctrine of vital force does not necessarily involve absolute and complete control over these agencies. The vital agency may, by its very nature, be capable of assimilating only certain particles into the living substance. The simple repetition of the act of assimilation may involve the weakening of the assimilating force. The introduction of uncongenial material, in quality or quantity, may both deteriorate the various tissues which are its product and hasten its dissolution. Organized matter may be but an equilibrium of balanced forces, the chemical and mechanical on the one side, and the vital on the other. When the balance is disturbed, disease may be the consequence; when it is entirely and irrecoverably lost, the dissolution of the organism may follow.

No objection that it is individual.

Another objection may be urged against the doctrine of a *vital force*—that it is, by its very definition, an individual agency, and that science can know nothing of such forces or their laws. Science, it will be alleged, knows only general agencies with their universal laws. To this it might be replied, so much the worse for science, if its conceptions of being are so one-sided and narrow, and its assumptions are so hasty

and positive. If science does not recognize the individual, it must overlook the best result of science, which is to explain individual events by general laws. It must deny purpose and design in nature, which must be assumed to impart the highest interest to every combination of universal agencies. It would seem that the general and the individual are correlative conceptions, and the denial of the one as a fact must involve the impossibility of the other as a thought. Though it may be true that science has the most direct concern with the general, yet it is also true that it impliedly assumes the individual as giving meaning to the general. In the recognition, on proper proof, of a vital force, as an individual agency with common characteristics, she brings these two poles of knowledge together, or very near to each other, as it may be expected she would in one of the higher forms of being. Should these two relations lead her to a completed circle in the conception and laws of a form of being still higher, it would be none the worse for science, in respect to the surety of her foundations, or her claims to confidence and respect.

2. *Relations of the Soul to Life.*

The facts and considerations adduced establish the existence of a vital agent or force. It has already been asserted, and will hereafter be proved, that there is a soul or subject of those higher activities which are known to consciousness, viz. the rational, the emotional, and voluntary. Assuming this to be true, the second of our two questions naturally arises at once, what is the relation of the one of these to the other? *What is the relation of the soul to life?* Are there in man two distinct agents or principles, viz., the vital and the psychical, or do the two coincide in one, the separate terms being abstractions, hypotheses for the diverse functions that are appropriated in language to each? This question has, like the question respecting the principle of life, been variously answered. The doctrines of the ancients, in respect to the community and separableness of the two, have already been referred to. In modern times, those who have rejected the materialistic theory have almost universally contended that the subject of conscious activity is an agent or essence distinct from the principle of life. The agent or force which thinks, feels, and wills, has been supposed to have nothing to do with the processes which originate and direct the corporeal functions. The connection between the two agents or essences has usually been regarded as that of mere coexistence or intimate relationship. These views were the natural result of the dualistic theory of Descartes, in asserting for extension and thought,—set forth by him as the fundamental or essential attributes of matter and spirit,—entire irrelativeness to one another. Since his time, in all the varieties of psychological and physiological theories, those who have held the soul to be spiritual and immortal have almost uniformly and unanimously held that the agent of knowledge and feeling is distinct in essence from the principle of life. One exception deserves to be named, in the school of G. E. Stahl, (1680-1734,) the eminent physician and chemist. Stahl maintained that the soul was active in the formation and functional processes of the body, as well as in the exercise of the conscious activities; but he connected with this theory certain extreme doctrines which seemed to be inconsistent with its spirituality and independence of matter, as well as with the plainest facts of experience.

History of opinions.

The progress of physiology in recent times, as well as the more careful study of the conditions of certain of the psychical phenomena, have seemed to favor a theory intermediate between those of Descartes and Stahl, a theory teaching the identity of the vital and spiritual forces. It may be stated thus: The force or agent which at first originates the bodily organism, and actuates its functions, at last manifests itself, as the soul, in higher forms of activity, viz., in knowledge, feeling, and will. In other words, the principle of life and of psychical activity is one.

In support of this opinion the following facts are adduced: The vital phenomena precede the psychical in the order of time. But, in connection with the first appearance of the latter, there are no indications to consciousness or observation of the beginning of a new being or agent. The first activities of the soul are not only manifested much later than the functions of life, but they are at first rudimentary and very partially developed. They are also blended with the functions of life, both in conscious experience, so far as we can recall them, and to the observation of the look-on, so far as he can penetrate beneath the outward appearance. Were the soul an essence wholly distinct from the vital agent, we should naturally expect that the beginning of its existence would be made known by decisive evidence. But there is no evidence of the sort. We curiously ask, When does it begin to be? We cannot easily believe that, if its existence begins with life, it should remain dormant so long, and yet be another being.

The energy of the two propensities

When life and soul are fully developed, the general intensity or energy of the powers of each vary with one another. As the tone of the bodily life so is the general energy of the soul's capacities, its capacity for keenness of perception, clearness and range of memory, power of reasoning, energy of feeling, strength of will. When this tone of life is lowered, as in sleep, faintness and disease, there is a general tendency to depression of the psychical activities. This is the general rule or fact, to which there are apparent exceptions to which we shall next refer. This general rule would indicate a common essence, provided this can be reconciled with other facts.

Sometimes in-
versely.

This community of essence is still further indicated and attested by phenomena which look at first in the opposite direction. We refer to those facts which indicate that certain special activities of life are incompatible with certain special activities of the soul, or at least that the greatest energy of the one must be at the expense of the greatest energy of the other. Some of those functions which pertain to the so-called vegetative or nutritive soul, as of growth, digestion, sleep, draw upon the higher nature. They seem to be so exhaustive and absorbing of a certain common stock of energy, as to leave little force for intellectual or emotional activity. Hence in the early period of life, when the growth and maturing of the bodily substance and organs are going on, the intellect is physically incapable of the strain and effort attendant upon certain functions. In adult years the states of body most unsuitable for such activities, are the states which are devoted to rest, recuperation and nourishment. In disease and old age not only is the general tone of both body and mind lowered, but the little energy that can be used by either seems to be withdrawn from the psychical functions and husbanded by nature to defend and sustain the nutritive activities. These phenomena are best explained by oneness of essence.

The Conscious
depend on un-
conscious activi-
ties.

Again: many of the conscious activities of the soul are dependent upon certain conditions and excitations which involve relations and activities of which it is wholly unconscious. Some of these are material and involve relations of the soul to organized, i. e., living, matter. These are best explained on the supposition that the vital and psychical essence is one. Others are immaterial, but the existence of these proves beyond question that the activities of the soul are not limited to what are usually recognised as its conscious phenomena.

Examples of these activities and processes are the following: The act of sense-perception requires as its condition a material object, a sensorium or nervous apparatus, the excitement of the sensorium, usually through the medium of the sense-organ, and the transmission of this excitement by a continuous and uninterrupted nervous organism. All these are processes of the unconscious in man, whatever this may be, and pertaining in part, it may be, to the living body, and dependent on the vital force alone, if there be such a distinct agent, in part to that in the nature of the soul which qualifies it to be excited by the aroused sensorium. Now whether or not the life and the soul are one, this certainly must be received as unquestioned, that in addition to the soul's capacities for conscious activities, it is capable also of certain unconscious processes. The consideration of this fact removes the chief objection against its identity with the principle of life, inasmuch as it demonstrates that its nature or essence is complex, and extends beyond the sphere of its conscious activities. This complexity may reach so widely as to include capacities for those processes which we call vital.

The soul acts on
matter.

But still further it is to be observed that some of these processes and relations respect material existences, and some of these consciously imply relations of extension and place. We do not insist on the point that the soul must in some way or other cognize material and extended objects, but upon the truth that the sensational element in sense-perception involves an apprehension of some connection of the soul with the living, viz. the extended, organism. This fact, indeed, is overlooked in the theories of some psychologists and denied in those of others, but it cannot we think be set aside (§117). If, however, this relation of the soul to extension is not pressed, because it is still in dispute, it can not be denied that the soul is so related to extended matter as to be capable of exciting and directing the activities of its own body. The conscious perception of matter being laid out of view, as well as the conscious location of the soul's sensations, the relation of the soul to matter remains unquestioned. The soul holds at least those relations to extension and matter which are implied in the unconscious processes or acts which fulfill its conscious determinations. This fact is fitted to set aside those objections against the identity of the vital and psychical force which are founded on the alleged impossibility that the soul should hold any relations whatever to extension. Whatever view be taken of the soul's spirituality, the fact cannot be overlooked that it is capable of being affected by and of acting upon extended matter.

The soul adapt-
ed to the body.

Again: the body is in general and particular adapted to the habits and uses of the species and of the individual soul with which it is connected. This adaptation is so manifold and complete as to indicate that the agent that forms and moulds these peculiarities is the same that uses and applies them. The human body is unlike the body of every other species of animals, not merely in its external features of form and function, but also in its special capacities to be the servant of the human soul. The hand is not merely a more dexterous and finely moulded instrument than the forefoot of the quadruped and the paw of the monkey, but is specially fitted to be used by the inventive and skilful mind. Every other part of the human body is also especially harmonious to and congruous with the human soul, as intellect, sensibility and will. Not only is there a general harmony between the body and soul of the species as a whole, but there is in individuals a special harmony between the body and soul. The eye that is capable of discerning the nicest shades of color, or tracing graceful outlines of form, is usually conjoined with a special delight in color and form, as well as with a capacity of hand to reproduce what delights both soul and eye. The ear that is physically refined in its discrimination of sounds and musical tones, is usually attended by a special sensibility of the soul to the delights of elocution and music, and with

the physical and psychical capacity to produce the sounds which give it such pleasure. Quickness of intellect is attended by organs that are mobile and acute and a temperament that is harmonious with both intellect and organism. It is possible to account for these fine adjustments of nature by a general law of pre-established harmony between the corporeal and the psychical, or by a special and individual direction of Providence in every instance, but they are more rationally explained by supposing the vital agent that forms the body and the psychical agent that uses it to be one and the same, and thus affirming an original harmony between the bodily and the spiritual endowments and capacities of this identical agent.

The body is moulded by the soul.

This conclusion is rendered more probable by the well-known fact that after the body is formed and developed, and has become the dwelling-place of the soul, it is changed in many respects, and as it were, formed anew by the influence of the conscious activities. The thoughts which are entertained, the feelings which are cherished, and the purposes which are enacted, mould and form the body within and without so as to be a readier instrument and a more fit manifestation of the spiritual activities and states. The fact is unquestionable. By what intermediate psycho-physical processes is this result effected? If there be a vital principle, it must be accomplished by its agency. In the gradual, but steady and certain progress made by the soul in impressing itself upon the body, it is not the matter of the body, considered as matter, that the soul moulds and fixes for its uses by the slow but certain influences of years, or a lifetime. It is only the living, organized body that is sufficiently plastic to respond to these forming influences. But it can be rendered plastic only by the power of the vital force. If this force be not one and the same with the psychical agent, the two must be adapted to each other by an arrangement more wonderful, and must work with one another with a harmony more extraordinary than the union of the two in the same essence could possibly involve.

The sudden influence of vivid conceptions, or of excited feelings upon the muscular activities, is an other example of the power of the soul over the body. The imagination of a scene of cruelty and suffering makes the flesh creep, puts the limbs into attitudes of defence and aversion, and awakens the features to expressions of disgust or horror. Terror induces fainting, convulsions, and death. All these phenomena are entirely consistent with the theory which makes the vital and the psychical forces to be one.

The body manifests the soul.

The capacity of the body in look, gesture, and speech, to express the thoughts and feelings of the soul, and the capacity of the soul to interpret these bodily movements and effects as language, and to look through them into the soul within, by an impulse and an art which could never be either taught or learned if nature itself did not prepare the way—all these phenomena which elevate the body itself almost to a spiritual essence, are more easy of explanation, if we suppose that with the capacity for the psychical activities which are peculiar to every individual, there are also connected in oneness of essence those vital powers which act in such fine and subtle harmony with them.

Objections. The two cannot be related.

To the identity of the vital and psychical agents, the following objections are urged. Psychical and vital activities, and the agents of each, have no possible relations to one another, and their force cannot be united in the same being. The alleged incompatibility between the two was stated in its extremest form by Descartes: 'Thought is the essence of spirit—extension is the essence of matter; and these have no relations to one another. The one is known by consciousness; the other by perception.' These definitions, which were at first esteemed so satisfactory, because they emphasised important distinctions, were found to be imperfect and one-sided by the absurdity of the logical extremes to which they were carried. If thought is the essence of spirit, and extension the essence of matter, then, it was inferred, it is impossible for matter to impress spirit so as to be known by it; and it is equally impossible for spirit to act upon matter so as to impel and direct it, and yet both of these are incontestable facts. To overcome this difficulty, several theories were devised by the disciples and successors of Descartes, each of which was in its turn rejected as being as forced and extreme as the original definition which made it necessary. 'Body and spirit have no real influence or activity upon one another, said one theory—the phenomena or changes of the one are merely occasions of corresponding changes in the other.' This was the theory of occasional causes, or occasionalism, as held by *Gassendi*.

'These phenomena are arranged beforehand to take place in a perpetual parallelism or harmony, each series of which runs forward in a separate line of events that matches with or corresponds to the other, without any causal connection.' This was the theory of pre-established harmony, maintained by *Leibnitz*.

'Matter and spirit have no separate existence; there is only one substance in the universe, of which thought and extension are the corresponding attributes or phenomena, each correspondent to each.' This was the theory of *Spinoza*. The influence of these definitions has been felt to the present time in the assertion of what are esteemed the essential constituents of matter and spirit, in many psychological theories and metaphysical discussions.

But they are related.

But whatever may be assumed or laid down by philosophers as essential to the conceptions of matter and spirit, the fact remains unquestioned that the two are capable of mutually affecting one another. The extended and the non-extended show that they are capable of holding mutual relations. Matter, though extended, does actually affect spirit, though it is non-extended. All theoretical inferences founded upon the

a priori assumption that extended spirit and extended matter can have no relation one to another, are set aside by these obvious facts, attested by observation and experience. The one does not affect the other, and every objection against the essential unity of life and spirit derived from their irrelativeness is effectually disposed of by this incontestable fact.

It is still further to be observed that the matter which affects the spirit, and which is in turn affected by it, is not matter which is inorganic or dead, but always that which is organized and living. It is the matter that is ensouled, i. e., formed and animated by the vital principle, of which the spirit feels the presence in its sensibilities, and which it can move in accordance with its will. If the principle of vital force and spiritual activity be one and the same, then we can easily see how this agent should first prepare matter for its higher uses, by giving it the endowments of life. This involves no subjection of spirit to matter, but rather the subjection of matter to spirit, if indeed the latter can take the former and by lower and unconscious activities can mould it for a dwelling-place and instrument for its service and uses, before it enters into the possession and mastery of it by sensibility and intelligence.

It is objected again, that the view which is urged would bring the soul of man into too near an affinity with the so-called souls of animals and of plants. If the spirit of man gives life to his body, then, it is urged, it is possible that that which gives life to the plant and the animal may be endowed with the attributes of intelligence and personality. This does not follow as a necessary inference, by any means. The fact that the soul of the plant has certain capacities and performs certain functions which we call vegetable and living, does not carry the inference that it might also perform the higher functions which pertain to the animal. No more does it follow that the so-called soul of either should in their nature be capable of performing the still higher functions which are peculiar to the spirit of man. What is asserted is simply that the spirit of man, in addition to its higher endowments, may also possess the lower powers, which vitalize dead matter into a human body. Because there are other agents in the universe which have the capacity to form and animate animal bodies, each in its kind endowed with its appropriate capacities and sensibilities, and these agents are like the human soul in its lower functions, it does not in the least follow that these lower souls can ever become human spirits, or can exercise human intelligence or attain to human personality.

It, again, is urged that the soul of the plant can be divided by the knife or separated by buds or germs, these facts pertain only to the vital functions of this kind of living beings. They do not degrade the human soul to a likeness with themselves in any of those particulars in which it is most diverse from them. Its higher endowments are not lowered in dignity because there is claimed for it the additional function of forming for itself a material structure by a vital force which is like that which the plant or the animal possesses. The plant and the animal on the other hand are not exalted to a higher position or a more exalted destiny, of intelligence, personality, or immortal existence because they are like the human soul in the single particular of ministering life to a material organism.

It might be objected, again, that this view is incompatible with the doctrine of the natural and necessary immortality of the soul. The immortality of the soul has ever since the time of Plato, been often, not to say generally, taught as a necessary consequence of its ethereal essence, which, in its turn, involved an essential superiority to and non-conformity with gross matter. Plato taught the preexistence of the

spirit, and regarded its connection with matter as an imprisonment of its energies and a soiling of its purity, and the remnants of these doctrines have survived till the present time, and have been supposed in a certain sense to be sanctioned by, or at least to be more consistent with the Christian doctrine of immortality. Whatever is important in the Platonic or the Christian view of the spirituality and immortality of the human spirit is not at all diminished by the doctrine of its unity with the vital force. That the soul should begin its existence by vitalizing dead matter into a sentient organism is, as has already been intimated, a token of its power over matter. If this involves a transient subjection to material laws and material limitations, this may be necessary for its education and moral discipline. That the lower powers should be developed first in the order of time, before the higher capacities are matured, does not detract from the essential superiority of the latter when they are in fact unfolded, nor from their immortal existence and continued activity. That the soul begins to exist as a vital force, does not require that it should always exist as such a force, or in connection with a material body. Should it require another such body or medium of activity, it may have the power to create it for itself as it has formed the one which it first inhabited, or it may already have formed it in the germ, and hold it ready for occupation and use as soon as it sloughs off the one which connects it with the earth. These are possibilities, it is true, but they are sanctioned by sufficient evidence to set aside the objection which we are considering. They permit the only theory of the soul's continued existence in another state which is consistent with the facts of our present being. Whatever may be our speculations in respect to a pre-existent eternity for the soul, the evidence of observation and of facts is decisive that it begins its existence as a vital agency, and emerges by a gradual waking into the conscious activities of its higher nature. These facts it is the duty of the philosopher to adjust to the conception which he may form of its more exalted nature and its immortal destiny. He may not by mere speculation set aside the plain and incontrovertible evidence of these indisputable facts or the suggestions which they involve.

Animals and
Plants must
have souls.

Inconsistent
with the soul's
immortality.

Consciousness testifies to the opposite.

Last of all it may be objected that consciousness testifies to a direct incompatibility between matter and spirit, which is decisive against the theory in question. That consciousness testifies that the matter which we perceive is not the spirit which perceives it, and is, in its distinguishing attributes, totally unlike it, we have already contended; but this testimony does not authorize the conclusion which is derived that spirit cannot vitalize matter. On the other hand, while consciousness testifies to the total unlikeness of matter and spirit, it is also continually reminded that spirit is closely implicated with matter in all its activities and experiences. The human soul knows that it is not the body which it inhabits, directs and resists; but it also knows itself to be in many respects subject to its power. It suffers pain and pleasure through all the extended organism, and depends upon its aid for power to exercise its loftiest endowments. In every form of sentient as distinguished from intellectual and emotional activity, the soul is conscious that it is connected with the material structure from which it distinguishes itself. The fact of this connection is that which consciousness most constantly attests. While, then, we accept its testimony to the essential antagonism between spirit and matter, we accept its testimony, also, to the intimate union of the two. This union we best explain on the theory that spirit possesses the power to shape matter into a living existence. Consciousness does not attest directly to this view. By the nature of the case it were impossible that it should. But it does affirm certain phenomena which are best explained by the theory that the activities of which it is directly the witness are performed by the same agent which forms and vitalizes the body, by processes to which consciousness can have no access, because they are by the nature of the case withdrawn from its inspection.

The result to which these considerations lead, is only probable. We can at best establish the theory as hypothesis which is more plausible. So far as we have any evidence it is founded on analogies that are narrow in their origin and uncertain in their application. But for the reasons already given, we incline to the opinion that in man the vital and psychical agent is one.

Compare Aristotle, *ΗΕΠΙ ΨΥΧΗΣ*.—G. E. Stahl, *de Vita*. Halle, 1701.—John Hunter, on the *Animal Economy*. London, 1786.—John Abernethy, on *Hunter's View of Life*. London, 1814.—J. C. Prichard, on the *Vital Principle*. London, 1829.—W. Prout, *Bridgewater Treatise*. London, 1834.—W. B. Carpenter, *Human Physiology*, also, *Art. Life*, in *Todd's Cyclopædia*; vol. iii. London, 1839-1847.—C. Darwin, on the *Origin of Species*, etc. New York, 1880.—J. H. Huxley, *Origin of Species*, etc. New York, 1863.—Herbert Spencer, *Principles of Biology*; 2 vols. New York, 1867.—Professor Richard Owen, *Archetype and Homologies of Vertebrate Skeleton*. Van Voorst. London, 1848. Do. *Comparative Anatomy: Invertebrata; Vertebrata*. Longman. London, 1855. Do. *On the Nature of Limbs*. Do. *Discourse on Parthenogenesis*; both Van Voorst. London, 1849.—Do. *Paleontology*, 2d ed. Longman. London, 1861.—T. Laycock, *Mind and Brain*. Edinburgh, 1860.—J. Müller, *Handbuch der Physiologie des Menschen*; 2 bde. Coblenz, 1835-1840. Do. translated by William Baly. London, 1848.—H. Lotze, *Arts. Leben und Lebenskraft, Seele und Seelenlehre in Wagner, Hand-Wörterbuch der Physiologie*.—H. Ullrich, *Gott und die Natur*. Leipzig, 1862. *Gott und der Mensch*. Leipzig, 1866.—I. H. Fichte, *Anthropologie*. Leipzig, 1860. Do. *Psychologie*. Leipzig, 1864.—Fr. Bouillier, *Du Principe Vital et de l'Âme Pensante*, A. Lemoine, *L'Âme et le Corps*. Paris, 1863. Do. Stahl et l'Animisme.—J. Tisot, *La Vie dans l'Homme*. Paris, 1861.—E. Salmat, *Recherches Nouvelles sur l'Âme et sur la Vie*.—*Revue des Deux Mondes*, vol. xl.—H. Philibert, *Du Principe de la Vie, suivant Aristotle*. Paris, 1865.

III.

THE FACULTIES OF THE SOUL.

WE assume, as has been already stated, that the soul is endowed with the capacity to know its own phenomena. Reserving for future consideration the nature, the development, and the authority of this power, we proceed to apply it in inquiring what consciousness finds to be true of the soul, in its phenomena, their conditions and laws. This is the question which we are continually to repeat during the entire course of our investigations. A well-ordered arrangement of the answers to this question would give a system of psychology

Question concerning the faculties.

§ 26. The inquiry which comes first in order is the following: Do we find by consciousness that the soul is endowed with separate faculties or powers? This question is preliminary to all others, for it must be answered, that we may direct the classification which we shall adopt, and fix the terminology in which to express

the results of our investigations. The question has been earnestly discussed, and opposite opinions in regard to it have been zealously held and defended.

§ 27. We answer, first, negatively. We do not find that the soul is divided into separate parts or organs, of which one may be active while the others are at rest. The plant and the animal have distinct and separate organs, of which each performs its appropriate and peculiar function, which none of the others can fulfil. The root, the bark, the leaf, the flower, in the one, and the stomach, the heart, the skin, and the eye, in the other, each performs an office which is peculiar to itself, and which it shares with no other organ. While one of these organs is active, the others may be as yet undeveloped or in a state of comparative repose. There is no evidence of such a division of the soul into organs. The whole soul, so far as we are conscious of its operations, acts in each of its functions. The identical and undivided *ego* is present, and wholly present, in every one of its conscious acts and states. We can find no part, we can infer no part, which is not called into activity whenever the soul acts at all. We can discover and conjecture no organs, of which some are at rest while others are in activity.

This peculiarity of the soul has not always been noticed as it should be; certainly it has not always been kept in mind. The so-called faculties have often been conceived and described as separable organs or parts of the soul's substance, any one of which might act of itself—nay, one or another of which might be conceived as added to or superinduced upon another, giving so much enlarged and diverse capacity. Sometimes the faculties have been represented as acting not only apart from one another, but apart from the conscious soul itself; the soul being conceived now as an arena or show-place within which the faculties might prosecute their work or play, the soul being impassive and incognizant; or now as a spectator of their doings, more or less indifferent or interested. These representations are all derived from the analogies furnished by matter and its actings; they find no warrant in our conscious experience. The fact that these representations are often allowed, and that they influence the reasonings and conclusions of many philosophers, who in form reject them, is urged with great earnestness by those who reject the term *faculty*, and the corresponding conception, on the ground that the doctrine and the name conflict with the soul's unity and identity.

Again, we do not find it true that the soul can only act with one of its so-called faculties at the same instant of time. Some suppose, perhaps inferring from a misconstruction of the doctrine of the faculties, that when we know, feel, and decide, or when we perceive, remember, and judge, we must perform each of these separate acts in a definite and distinctly separable instant of time. Consciousness does not allot to each distinguishable kind of activity a separate interval or moment of duration, but before its eye many such distinguishable kinds of activity are united in one undivided act. We might, indeed, conceive each of these activities to require a separate instant of time, but we do not find this to be true in fact. Not only, then, is it not true that the

Faculties not parts or organs.

Faculties often misconceived.

Each faculty does not act at a separate time.

soul is divided into separate parts or organs, but it is not true that it cannot act variously, or with all its faculties, in the same apparently instantaneous act.

§ 28. Thus far have we distinguished what is not true of the actings of the soul and of the faculties to which these actings are ascribed. We ask next, What is true, and how far is the conception and the use of the term *faculty* authorized by what consciousness discovers or attests? We assume that the identical *ego*, or *I*, is not only distinguishable from its own states, but that each of these states is separated or individualized from every other, by occupying a separate portion of time. Each of these states is known by the soul's consciousness to be individually different from every other. But though they are thus separated or severed from one another, they are united by another relation. Among these separate acts there are many which are alike in certain prominent characteristics or elements. These are grouped together as the same in kind. They are discerned and pronounced to be similar, and are therefore viewed and named as the same. Others are, for another prominent element, gathered and named as another group. The groups thus gathered, each under a common likeness, are as clearly separated from one another, as the individuals in each are united by the likeness of their common element. As we look more closely, we find that these states are united and distinguished for the following reasons:

First, the prominent elements are known to be alike or unlike in the immediate experience of the soul. The person who is the subject of each, knows that what he calls his acts of knowledge are alike, and also that they differ from his states of feeling and of will, as readily and as distinctly as he knows blue from red, or green from violet, or hard from soft, or bitter from sweet. He does not discern them by the bodily eye, nor have they material qualities, nor are they dependent on bodily organization; but they are as clearly different, and, if possible, they are more perfectly distinguished than any of these objects. For if the soul knows any thing, it knows its own states—not only *that* they are, and that they are its own, but also *what* they are in their quality.

If consciousness can pronounce upon any thing, it can pronounce upon what is like and unlike in its inner experience. These states are not its experiences only—they are very largely its own products, the results of that self-active and tireless energy by which the *ego* is continually passing into new conditions of being, or rather taking new forms or phases of action. Many of them are produced of design, the soul distinctly setting before itself what one of its possible states it will employ as the required means or conditions to bring them to pass. Unless the soul could distinguish the quality or character of its own states, it could not design to produce them, either by direct or indirect agency.

2. The elements which are the ground of the classification of the several states are not only recognized as like or unlike, but each has a relation of dependence with respect to

the others. Not only is one state different from another, as a so-called state of knowledge, feeling, or will, but the element of knowledge is known to be the necessary condition of the element of feeling, and the element of feeling the condition of that of will. A man does not feel, except he knows or apprehends some object which excites feeling. He always feels about or with respect to something cognized.

An apparent exception to this law is believed by some to present itself in the case of sensible perception, in every instance of which it is contended that the feeling—viz., the bodily sensation—is the condition of the intellectual apprehension, viz., the perception. In all other cases, it cannot be questioned that the mind only feels when, and because, it apprehends the object which excites the feeling. When it would increase or intensify an emotion, it applies the intellect to the appropriate object with greater energy and a more exclusive concentration. When it would excite the feeling anew, it brings the object before the attentive intellect a second time. When it would rid itself of an emotion, or prevent its return, it occupies the attention with some other objects, so as to excite an emotion that shall exclude or displace the first. So clearly is this dependence recognized, that all the laws of practical wisdom are founded upon it in respect to deliverance from or security against feelings that are either uncomfortable or wrong. The lower exercise of prudence and self-control, as well as the higher discipline of virtue and self-improvement, are both directed by the knowledge of the dependence of the element of feeling on the element of cognition.

Even more than this is true. Different intellects at the same time, and the same intellect at different times, take different views of the same objects, or apprehend in the same object different qualities and relations. As these vary, so does the emotion vary; and the same object occasions different feelings in the same persons at different times, and in different persons at the same time, according to the diverse judgments of the intellect.

There is a similar dependence in the acts or states of the will. To choose, we must not only know, but we must also feel. If an object could be simply known, and excite no feeling, it could not be chosen nor rejected. We repeat the caution which we have before provided, that it is neither intended nor asserted, that each of these elements occupies or requires a separately definable or continuous portion of time, or that each should, so to speak, stand apart before the eye of consciousness. They may, in fact or in seeming, be blended together in a single instantaneous state, and yet each may be distinguished as the conditioning, or the conditioned element.

We have, thus, a second criterion for distinguishing different kinds of psychical activity, as they are discerned to differ not only in their recognized subjective character, but in their exciting occasion.

3. Each act or state of the soul is characterized and distinguished by the presence and predominance of some one of the single elements which we have named. That is, each state of the soul is more conspicuously and eminently a state of knowledge, or of feeling, or of will, one of these elements being prevailing and predominant. It is natural and normal for the soul to blend all in one, and by the laws of its self-active nature, to spring at once into all these forms of its appropriate energy. If we conceive of it as knowing with

One element pre-
ponderant in
each state.

out feeling, and as feeling without choosing, we conceive of it as either undeveloped or abnormal in its actings, and as incomplete or mutilated in their results. Its normal activity includes all these elements. At every instant of its being it should leap as by a single bound, through the completed curve of its several capacities. Sometimes its course seems to be arrested; often it seems to be detained in a single element; most usually, we may almost say invariably, one only is prominent to the eye of consciousness, the other elements being scarcely noticed as present at all. We distinguish, remember, and name such a state by the predominating feature or element. We think of it and call it a state of knowledge, feeling, or will. We learn from it the appropriate characteristics of the function which prevails, because one element is conspicuous in this particular state.

Elements as related to agent, act, and object.

4. Another determining circumstance ought to be noticed. Each of the three elements which we have as yet recognized seems to have a special relation to each of the three elements that are distinguishable in every act of consciousness, viz., the agent, the action, and the object (§ 77). In knowledge, the object seems to occupy the energies. In a state of aroused and concentrated attention, the object only is thought of, and the relation of the soul to the object is that of which consciousness chiefly takes notice. The soul itself, and the soul's activity, seem to be almost absorbed into the object observed. In feeling, the soul's condition is most engrossing to itself and conspicuous to others. In acts of will, the individual agent asserts its individuality to itself, and manifests it to others. The individual man shows by his choices, or acts of will, what he is; i. e., what he makes of himself by the direction and the energy of his individual will, as well as what he can do or effect in overcoming obstacles and accomplishing results within the sphere of matter or of spirit.

Faculty defined. General authority.

§ 29. These considerations prove that the several states of the soul are strikingly distinguished as like or unlike. The capacity of the soul for any one of these special kinds of activity we call a faculty. If it is asked, On what ground and by what authority? we reply, For the same reason that we ascribe or refer any material effect or phenomenon to a special power as its source or cause. If any effect is constant, we ascribe it to a permanent power or quality in the material substance. One ore of iron exhibits magnetic agency, and produces magnetic effects. To another these are wholly wanting. To the one we ascribe, to the other we deny the magnetic power. On the same ground, if there were no other, we might interpret psychical effects by referring each to a special psychical power, which we call a faculty.

Special authority.

But we have higher authority for recognizing special faculties in the sphere of spirit, than for admitting determinate powers in the world of matter. Of material agencies we perceive nothing but the effects. Of the states and effects of the soul we

are conscious that we are the producers. In the one case, we stand before the curtain and see the result, which we ascribe to agencies whose arrangement and working we cannot directly inspect. In the other case, we are ourselves behind the scenes, and observe the working, if, indeed, we do not ourselves work the machinery. We are not merely cognizant of the result when it springs up in our souls—which we find in act, we know not whence or how—but we bring the act to pass. We know the agent, and distinguish it from the act. We know, also, that its acts are often attended with effort, some with more and some with less, varying in all times to our conscious experience. To certain actions, issuing in certain results, we are prompted by no effort at all. We cannot by effort prevent ourselves from performing them. With these it is with eminent propriety that we connect the term faculty, from *facilitas*, as explained by Cicero: "*Facultates sunt, aut quibus facilius fit, aut sine quibus aliquid confici non potest.*"—*Cic. Inv.*, 1, 27, 41. Indeed, to say that we perform such acts with facility, is to say very little that expresses the fulness of our meaning. Power expresses far less, and hence we limit faculty to those of the powers which are original, and not acquired. To a facility acquired by art, or imparted by special education or discipline, we give the name power.

This is not the place fully to discuss the question, why we refer effects in matter or in spirit to powers or agents as their necessary originators or conditions; nor why we interpret the kind or quality of the power by or through the kind of effect or action which is produced. Nor can we here adjust the question, What relation has the conscious exertion of energy by the individual agent to the conception of power which we apply respectively to the material and the spiritual actor? It is sufficient that we notice the fact, that we do apply it to both kinds of beings, and that we do it with the highest propriety and with the most assured confidence to the capacities of the spirit—the states of which do not come and go as clouds chase each other across the heavens, or as one wave pushes another along the ocean, but are known to be the manifestations of the energy of a self-conscious originator.

§ 30. We call the faculties thus ascertained, the human faculties. We do so, because certain states of the soul, and certain elements of these states, are believed to be alike in all human beings. No soul is truly human in which they are not present. The exercise and experience of them is necessary to every perfectly constituted and fully developed human being. They may not all be active in an infant of a few days old, but they are sure to become so, if the infant lives and nothing interferes with its normal development.

But when we say that the soul must possess these powers in order to be human, we do not assert that any two human beings possess them in the same proportion, or exercise them with the same energy. All men perceive, remember, and reason; but all men do not perceive with the same quickness and accuracy, nor do all men remember with the same readiness and reach, nor do they reason with equal certainty and discrimination. The sensibilities of some men are obtuse, and of others are acute. The choices and practical impulses of men differ most of all. By these,

These faculties
common to all
men.

But not in the
same proportion.

each man is preëminently himself, sharing in no sense his individuality with any other human being.

The faculties not independent of one another. § 31. In these natural and original differences, the faculties are not altogether independent one of another. A powerful intellect, to be developed into its normal attainment, needs to be stimulated by strong feelings and to be held and directed by a determined will. Nature usually provides for the possibility of such a development, by proportioning the several endowments of the soul to one another. Hence, a man superior in intellect is usually superior in the capacity for energetic feeling and effective decisions. If there be a marked disproportion between any one and the others, we observe it as irregular and unnatural.

Any such irregularity is sure to be manifest, and often to be strikingly conspicuous in the development of the powers, from the weakness and limitations of infancy up to the energy and comprehensiveness of adult years. The soul with a structure strikingly abnormal, cannot attain a healthy and shapely growth. Any striking predominance of the intellectual over the emotional powers, or any defect in energy of will, either prevents an even progress, or induces premature feebleness or a dwarfish stature.

Relation of faculties in education. § 32. This law needs to be observed in the artificial development of the soul, by special methods of discipline or plans of education. The whole soul must be educated in the harmony of its powers, or it cannot be successfully educated in any single one. The intellect cannot be trained to superior activity or successful achievement except as the feelings are stimulated to a strong interest for the objects to which the intellect is applied, or the ends for which it acts. The will must be taught to concentrate and hold the energies, and to direct them to harmonious and successful activity. We cannot, if we will, train a single power alone. When we seem to bestow all our power upon one only—as the intellect—in the education of ourselves or of others, we are always, in fact, acting upon the whole soul, in exciting new habits or kindling new aspirations.

Illustrates the unity of the soul. § 33. These truths are not only of great practical importance, but they need always to be kept in mind in psychological investigations, because they so strikingly illustrate the organic unity and the eminent individuality of the soul.

We need ever to be mindful of this. Science seeks after resemblances, and thus is continually impelled to overlook differences. Or, if science notices differences, it is the differences by which species are distinguished, not those by which individuals are separated. With those individual peculiarities which refuse to be classed with any other under some common conception, science disdains to concern itself. All objects in Nature have in some sense an individual unity, which science cannot wholly master and overcome; but the soul is more intensely and eminently one and individual than any other. Its oneness, and hence its individuality, is the most complete and conspicuous of that of any of the objects with which science has to do.

Unity—mechanical, chemical, organic.

We say a piece of iron, or any mere aggregate or mass, is one, when its constituent particles or atoms are permanently held together by adhesive attraction. The law of chemical affinity makes two unlike substances into a third unlike either, which is eminently *one* by the completeness of the interpenetration and combination. But even bodies thus made one can be readily made *two* again through mechanical division, without altering their nature or changing their functions. It is not so with a plant or an animal, with a few apparent but inconsiderable exceptions. A plant is one, so long as its several organs act together, and the functions of each conspire with the functions of every other to the common existence and the developed growth of the whole. The unity of the plant consists in, or rather arises from, the action of each of these organs with and upon every other, and the united action of the whole through the integrity of an undivided structure. Let this structure be once broken up, and usually the unity that is the life of the whole is destroyed. Though the parts are again united, the plant is no longer *one*; it is usually no longer a plant. The same is true, only more strikingly and eminently, of the living animal. The animal ceases to be one when its structure is divided, because the reciprocal action of its several organs is thereby forever rendered impossible.

But the soul is one in a higher sense even than the plant and the animal are one. It has, indeed, no material structure,

Psychical unity is higher.

the visible and tangible bond of its material organs, each appropriate to one of its complex powers. But these faculties are dependent on one another by a union so intimate, that the soul cannot act with one except as it also acts with the others. It cannot grow in the capacity or energy of one except as it grows in the energy of the others. One kind of action is the essential condition of the other, whenever the soul manifests its developed life. But above all, the soul, in all its conscious activity, refers these various forms of action, thus interdependent on each other, to one central force. It knows its unity, in a large portion of its direct experience. It is not more certain that it acts in various ways, each intimately related to another, than it is that one person, the undivided and self-conscious *ego*, acts in all these ways. This *ego* knows, in all its varieties of cognition, and all the variety of objects which it can apprehend. It also feels, as variously in the quality and intensity of this kind of subjective experience as its subjective and objective conditions allow. But it is by its acting in choice, or as the will, that its individuality is pre-eminently known to *itself and by itself* to be one, not only as it is endowed by nature with a separate individuality, but as it makes itself to be what it is by its individual acts.

It is true that each soul is like every other soul in those powers by which it is human. It is unlike every other, not only in the proportion of the faculties and attainments which are comparable to those minuter shadings of form and properties in the individual plant or animal,

which are beyond the reach of the classifying power, but also in the conscious and necessary reference of every action to the individual *ego*. It is preëminently one, as by its own self-activity it gives to each act of its voluntary and rational life a direction and energy which it shares with no other being and no other act of its own being. It was contended by Leibnitz, and with much show of reason, that of the myriads of millions of leaves in a forest, no two are exactly alike. We know that among the millions of human faces, each has individual peculiarities, a oneness that is eminently its own. But of all the human souls that are or shall be, each, though allied to every other by a common human nature, and obeying common human laws, has yet that individual oneness which is received from nature, which is the product of its circumstances, and, more than all, which is originated and sustained by its own individual energy.

§ 34. But though the soul in these respects is peculiarly and preëminently one, it is not thereby single in the sense of excluding a complex organization. Rather do its unity and individuality depend upon and require a complex organism of faculties and powers. We observe that, in all organisms, the more complicated is the structure, the more numerous the powers, and the more intimate their interdependence, the more conspicuous is the individuality. Just in proportion as the structure is complex in its organs and in the variety of its possible functions, just in that proportion is there the possibility of an unshared individuality, by means of the greater number of particulars in which no other single being can be like this one.

Unity does not
exclude com-
plexness.

The complexity of the soul is exemplified in the known variety of its observed modes of action, in the manifold conditions and objects to which it is known to be adapted, in the possible variety of others for which it has latent and unused capacities, and in the conspicuous variety that is attained by different individuals, as the result of differing developments and various culture. The soul is complex in its attributes and organization, as shown in the variety of the functions of which we are directly conscious; it is also capable of all the activities which are required by its connections with the living body, as it both sustains its life and development, and receives from it all the excitements and impressions which, known and unknown, are the conditions and attendants of its appropriately spiritual states. Its complex nature is further manifested in its capacity to cognize and be interested in so vast a variety of objects in nature and in all living beings, both those above and below and equal to itself. Not only has the soul capacities for those objects which are fitted to its original endowments, but these endowments, when further developed, seem to become like new capacities, and these are set over against their own special objects. Indeed, the very capacity for the manifold development of and increase in the power and range of an original endowment, is itself a striking proof that within every soul lie, as it were, unborn powers, which themselves contain the germs of other powers capable of being in their turn developed. The capacity for that great number of acquired energies, habits, and tastes which often become more than a second nature, itself argues a complex organism. If we consider the soul as capable of existing in new conditions of being, and as endowed with powers appropriate to such conditions that are as yet inactive and unsuspected, we must enlarge still more widely our conception of its complex structure.

But the more largely complex the soul is in the wealth of its known and its yet unrevealed endowments, the more strikingly is its unity illustrated in the working of these endowments with one another to the pro

gressive development and increasing power of a single living being. But its unity is most conspicuous in the circumstance, that the being refers this increase of knowledge, skill, and moral capacity to itself, through its conscious knowing, feeling, and choosing. The dignity of the soul is shown by its varied adaptations to the universe of matter, life, and mind, and by its capacity to respond to and interpret this complex universe by its answering powers, and most of all, in that it can distinguish itself, as the one agent and patient, from all which it observes and cares for.

§ 35. The powers of this complex yet individual soul with which our science is concerned, are those only which are manifested in or through its conscious acts or states. All the other powers are left unconsidered, except so far as they incidentally relate to these conscious exercises or experiences. Our conscious acts or states are separated into the three broad and general divisions of states of knowledge, states of feeling, and states of will. To know, to feel, and to choose, are the most obviously distinguishable states of the soul. These are referred to three powers or faculties, which are designated as the intellect, the sensibility, and the will.

History of the division into faculties.

This threefold division of the powers of the conscious *ego* is now universally adopted by those who accept any division or doctrine of faculties. It has taken the place of the twofold division which formerly prevailed, into the understanding and the will; according to which the sensibility, or the soul's capacity for emotion, was included under the will, and the affections, as they were usually called, were regarded as phenomena

of the will.

Aristotle divided the powers of the soul into the vegetative, the perceptive (including the phantasy), the locomotive, the impulsive or orectic (including the affectional and emotional), and the noetic. All these, except the noetic, are shared by the brutes. The Noûs was divine, perhaps preëxistent and imperishable. Cf. *De Gen., et Cor.* ii. 8; *De An.* iii. 5. The distinction of body, soul, and spirit, as we have already noticed, was nearly coincident with this, though more general, and recognised under the *Πνεῦμα* special relations to the Divine Spirit. The schoolmen retained this division, and distinguished three classes of souls, as follows: the vegetative, of plants, the vegetative and perceptive, of animals, the vegetative, perceptive and rational, of man. The two last have in common the impulsive and locomotive.

The moderns, throwing out of their classification the powers not apprehended in consciousness, reduced the remainder to two: the intellectual and impulsive, or the powers of the understanding and the powers of the will. This classification was a long time current.

Aristotle had recognised under the orectic, or impulsive powers—the powers of the will, which we have noticed—a threefold subdivision: *ἐπιθυμία, θυμός, βούλησις*. Theologians had for a long period distinguished the affections and the will, and zealously discussed the relations of the one to the other. Locke carefully and earnestly distinguished will from desire, without, however, proposing a threefold division of the powers (*Essay*, B. II. c. XI. §§ 6, 30, 31.) Reid does substantially the same, inasmuch as he retains the threefold division in its accepted import in his *Intellectual Powers*, *Essay* I., c. 7; but in his *Active Powers*, *Lesson* II., c's. 1 and 2, he limits the will to the capacity to determine or choose, excluding from it the capacity for both emotion and desire. Dugald Stewart (*Active and Moral Powers*), following Reid, adopted a threefold classification without the formal nomenclature. But Dr. Thomas Brown goes backward from all, distinctly asserting that the will is a modification of desire, and a volition is only the strongest or prevailing desire. *Lectures*, &c. Kant subdivided the impulsive and orectic into two, viz., *feeling and desire*. *Kritik d. Urtheils-Kraft, Einleitung und Anthropologie*. Prof. T. O. Upham distinguished the power of the soul formally, as *intellect, sensibility, and will*.

Hamilton divides the powers of the soul into the faculties of knowledge, capacities of feeling and powers of conation—i. e., of desire and will. Desire and will he distinguished respectively as a blind or fatal, and a free or deliberate tendency to act. *Met. Lect.* XI.

Modern opponents of faculties.

Among modern writers, Herbart and his school have made themselves conspicuous by rejecting the doctrine of faculties of the soul in general, and of the intellect in particular, as inconsistent with the essential unity of the soul, and as self-contradictory in both conception and statement. But Herbart insists most earnestly that the soul possesses a

capacity for self-assertion, and that these self-assertions vary both in kind and degree with the conditions which call them forth. His doctrine is not unlike that of Leibnitz respecting monads of all classes, and preëminently of the conscious monads, that they represent or reflect all other objects, and that in this individual capacity lies their individual being. But diverse capacities for these varying self-assertions, or, in modern terminology, for 'reactions,' involves all that is essential, and we may add, all that is objected to in the doctrine of 'faculties;' the one being no more incompatible with the soul's unity than is the other.

Herbart, moreover, affirms of the ideas—'*Vorstellungen*'—all that he denies to faculties, giving them the power to act and react on each other in such a variety of ways, and with independent energies, as to explain all the varying psychological phenomena. While he contends most earnestly that the soul is one—a monad without relations to space—he makes it the arena, literally the 'show-place,' of all manner of active and antagonistic agents, which are evolved from its own being by the objects that excite them.

The associational and cerebral psychologists reject the doctrine of faculties as commonly received, and resolve all the operations and products of the soul into the single power of association between its ideas, this being in their view the single function either of the soul or its ideas, and that into which all its remaining powers and activities may be resolved. See the account given of these systems, §§ 41, 43.

For Herbart's doctrine of the faculties, see his *Psychologie als Wissenschaft*, Königsberg, 1824; also J. D. Morell, *Introduction to Mental Philosophy*, Lond., 1862. See also A. Bain, *The Senses and the Intellect*, Lond., 1855. Against Herbart, see Lotze, *Mikrokosmos*, vol. i., B. ii., c. 2, Leipzig, 1856.

§ 36. We call these endowments of the soul, *powers, faculties, capacities*, with some difference of meaning and application for each.

Power, faculty,
capacity.

The word *power* is applied to the active properties of material objects, as well as to those which pertain to spirit. Originally, it was employed by Aristotle in contradistinction to act. Hence, power and action are always contrasted, and beings are always contemplated by him as *εν δυνάμει* and *εν ἐνέργειᾳ*. *Force* is quite as frequently used as *power* of material objects and agents, and in the collective sense *the forces of nature* are more frequently spoken of than its powers. When power is applied to the soul, it is used in a larger signification than faculty; for by it we designate the capacities which are acquired, as well as those which are original. All men are said to be endowed with the faculty of memory. A few are said to have, or to have attained to, the power of remembering with surprising reach and accuracy. All men have the *faculty* of sense-perception, but seamen gain the *power* of seeing objects at a very great distance.

Faculty is properly limited to the endowments which are natural to man and universal with the race. We also limit the term by a sense of natural propriety to those endowments which are especially spiritual, and which manifest the independent and higher energy of the soul.

Capacity signifies greater passiveness or receptivity than either of the others. Hence it is more usually applied to that in the soul by which it does or can suffer, or to dormant and inert possibilities to be aroused to exertions of strength or skill, or to make striking advances through education and habit.

It is to be observed, however, that in common life, and even in philosophy, we do not invariably use these terms with a technical precision or with uniform and invariable consistency. Thus we speak usually of the intellectual faculty, or the intellectual faculties—rarely, if ever, of the emotional faculty, or the faculty of feeling, or the voluntary faculty, or faculty of will. We almost invariably speak of the intellectual faculty or faculties, of the capacities for feeling, and of the powers or the power of will. The connection in each of these phrases explains the reason why each term is preferred, and suggests the shade of meaning which is appropriate to each.

Function, state
phenomenon.

§ 37. The normal operations of each of these faculties are called its *functions*. The term is taken from the action of the bodily organs. From these it is transferred to organs in the metaphorical sense, as the 'organs of government,' and the 'functions' which they perform. In both these applications it has come to mean, first, the appropriate operations of each, and then the activities to which they are appointed, set apart, or destined. This signification is prominent in the use of the term when it is applied to the activities of the powers of the soul. In this use it is assumed that there are activities for which the soul is designed—modes of operation which are destined for, or conduce to, the end of its being. Hence the normal or regular activities of these powers are called functions.

States of the soul are often spoken of. The phrase has passed into current if not into technical use. Strictly interpreted, it would designate the more permanent or enduring, as contrasted with the more transient phenomena. It has come, however, to mean any condition of the soul whatever, whether regarded as act or product, whether as the producing act or the produced effect.

Phenomenon is used as properly of spiritual as of material beings or agents. Literally, it means that which appears to, or is known directly by the senses: next in order that which is known as a fact by the mind. In science, it signifies more precisely that which is known as a fact, in distinction from its explanation by a force, principle, or law. Whether this explanation has or has not yet been furnished, makes no difference. Whatever is or is not yet explained, when viewed solely as a fact, is called a phenomenon.

The English word *appearance* carries with it the meaning, or at least the suggestion, of unreality. It often means and is understood as a mere appearance, a possible illusion. No such signification belongs to phenomenon, and hence the term *phenomenon* has become established in psychical as well as in material science as a technical term with a determinate meaning.

IV.

IS PSYCHOLOGY A SCIENCE?—*Can there be a Science of the Human Soul? and what are its Principles and Methods?*

In the preceding chapters we have impliedly answered these questions. In the subsequent examination of consciousness they will be discussed more fully, and the nature and authority of psychological science will be more completely described and explained. Cf. §§ 89-95. It seems desirable, however, that a condensed and formal statement of the nature and possibility of such a science should be presented, at the beginning of our inquiries, in connection with the various counter-theories.

Materials of psy-
chology; an in-
ductive science.

§ 38. Our own theory may be briefly stated, thus: The facts or materials with which psychology has to do are derived from two sources—consciousness and sense-perception. Con-

consciousness is the source from which these materials are directly derived, and it is the facts of consciousness which psychology primarily and almost exclusively seeks to arrange in a scientific method, and to explain by scientific principles. But, indirectly, sense-perception comes to the aid and support of consciousness, as physiology furnishes that knowledge of the functions and states of the body which prepare the objects of the sense-perceptions, and are the essential conditions of the development and the activity of the soul. The facts of this class are attested by the senses and interpreted by induction, and are in all respects subject to the laws and methods of the other sciences of matter. Both these classes of facts must be considered in conjunction, must be observed with attention, must be analyzed into their ultimate elements, must be compared, classed, and interpreted according to the methods which are common to it and the other inductive sciences.

Is also the science of induction.

So far it would seem that psychology is as truly an inductive science as are the sciences of any other existences or classes of beings. It is distinguished from them by two striking peculiarities. The first of these is, that its subject-matter is attested by consciousness to be *sui generis*, consisting of phenomena which cannot be resolved into material entities or agents, and cannot always be subjected to or judged by analogies furnished by material agents, phenomena, or laws. The second peculiarity is, that this subject-matter is in part the function of knowledge itself, being the very agency by which all scientific knowledge is effected, the knowledge of matter as well as the knowledge of the mind. This function, psychology must examine, not only in its various processes, and their relations to one another, but in its products, and their mutual dependence and relative authority (§ 57). This involves the analysis of the products themselves into their constituents, whether these constituents are gathered from experience, or are necessarily involved in the act of knowledge itself, and therefore derived from the nature of the soul as a knowing agent, and dependent upon it as their authority. By this peculiar feature, the science of the human soul becomes the scientific study of the principles and laws of all knowledge, and of each one of the sciences, and thus leads to the *prima philosophia*. In every other feature except this, psychology takes rank with the other inductive sciences, and is coördinate with them in its subjection to a common method. But by this last feature it becomes in a sense the arbiter of them all, as it tries and tests the methods and principles common to them all, itself included. While, then, psychology is an inductive science, with a peculiar subject-matter to which it points us continually, and to the source from which it is derived, as exempting it from the associations and prepossessions with which physical philosophy would invest it, it is not merely an inductive science, but is, in a certain sense, the science of induction itself. It certainly leads us to examine the fundamental principles of all the sci

ences, by showing that such principles exist, and demand scrutiny and verification.

These views are very generally received in respect to the nature of psychology as a science, and in answer to the question whether such a science is possible. The opinions of those who dissent from them may be classed as follows:

Psychology too vague; not mathematical.

§ 39. A very large number of persons deny that psychology can ever become a science, because of the vagueness and uncertainty of the subject-matter. They insist with especial earnestness upon the point that it is impossible to explain the processes of the soul by laws expressed in mathematical formulæ. They affirm that we can never go beyond certain general and obvious truths concerning the nature and activities of the human soul, because these activities are not discernible by the senses, cannot be verified by experiment and accounted for by what they call scientific laws. Science, they allege, knows nothing of powers, either in matter or in spirit. It does not concern itself with the constituents of things, or with the essential and ultimate properties of matter or spirit. It has to do with phenomena only, and it seeks to learn the order and laws of their occurrence by definite statements concerning their mathematical relations. Force is measured by number; so is the quantity of matter; so are pressure, motion, attraction, and repulsion, in short, every thing with which science, as such, has to do. The range of science proper, they contend, is limited within the domain where mathematical relations apply, and cannot include the facts of psychology to any effective or valuable result.

Reply — would render a science of life impossible.

To reply to this general position is here inappropriate. It is sufficient to say, that if this view of scientific knowledge should be accepted, it would exclude the science of life in all its forms as truly as the science of the soul. It is enough that it proves too much, and therefore cannot be true. Science does inquire after the powers, the conditions, and causes of phenomena, as truly as it concerns itself with the mathematical relations of either. Besides, it is always pertinent to observe, that the power by which we are impelled to seek, and by which we attain scientific knowledge, is the only authority for our confidence in science itself. To distrust the possibility of exact and determinate knowledge of the conditions and laws of *this power*, is to distrust the authority of science. If the soul, as the agent of science, cannot itself be known in its processes and their results, then the processes have no value, and the products no binding force.

This general prejudice against the possibility of attaining precise conceptions of the activities of the soul may be dismissed as the result of that ignorance which is intensified by a partial knowledge. No man is so positive in his prejudices against that of which he knows little, as the man who is master of a certain domain of knowledge, and therefore assumes to measure and judge that which he does not, by that which he does fully know. The *idola theatri* which Bacon, *Nov. Org.*, B. I., §§ 44, 62-65, so clearly describes and so pointedly condemns, have exerted their influence over no class of philosophers so conspicuously as over the physicists of the present generation, in their judgments of the claims of psychology to be regarded as a science.

Views of materialists.

§ 40. The materialists of every sort hold a very positive and consistent view of our subject. They all contend that a science of the soul is possible and real, because the substance of the soul is material, and its phenomena can therefore all be explained by the laws and relations of matter. Their cardinal axiom is: there is nothing substantially existent in the universe except what has extension and sensible properties. The phenomena of the soul are therefore the manifestations or actings of an existence of this kind, and can be resolved by scientific methods just so far as they can be referred to changes in the constitution or the actings of this extended and material substratum. We pass over the grosser and cruder theories of the ancient schools, who resolved the soul into some form of refined but unorganized matter, as now universally outgrown and

rejected: and notice only that form of modern materialism which passes current with so many scientific men. This theory makes the brain and nervous system the proper substance of the soul, and its phenomena to be explicable by the peculiar activity of this highly organized material substance. It has this in common with the materialism of the grosser sort, that it holds it to be impossible that there should be any agent of psychical phenomena except matter. The fact that the matter is organized makes no difference with this assumption, except that it smooths many of the difficulties and disarms many of the objections to which the cruder materialism was exposed.

Auguste Comte represents and describes this theory of psychological science in the following language: "The positive theory of the intellectual and affective functions is therefore henceforth unchangeably regarded as consisting in the study, both rational and experimental, of the various phenomena of internal sensibility, which are proper to the cerebral ganglia, apart from their external apparatus. It therefore is only a simple prolongation of animal physiology properly so-called, when this is extended so as to include the fundamental and ultimate attributes." 'In regarding it, however, as a simple subdivision of animal physiology,' "we ought not to leave out of view the very close connection of this third sort of physiology with animal physiology as it is usually understood, from which it differs far less than this last differs from simple organic or vegetable physiology." *Phil. Pos., Lect. 45, 3d vol., pp. 766-9.*

Herbert Spencer, though not an avowed materialist in form, shows that he is, in fact, in that he teaches that psychical action is only a more highly developed form of vital action, the capacity for which, in its turn, has been developed from a lower form of being, viz.: the unorganized. His materialism becomes conspicuous when he makes the *à priori* necessity under which he accepts necessary truths, to be itself the product of a tendency first acquired by frequent association; and then augmented into an inseparable connection, which, being transmitted with increased force through many generations of material or cerebral organisms, reappears at last in the form of *à priori* knowledge.

§ 41. The materialists of the present day are properly called Cerebral Psychologists, and plant themselves on the more recent discoveries of physiology in respect to the brain and the nervous system. These discoveries are those of the reflex nervous action by the agency of the *afferent* and *efferent* nerves, made by Sir Charles Bell: the discovery of the independent activity of the several systems of nerves, made by Marshall Hall; of the capacity for increased nervous energy, and the flow of a more effective nervous stimulus, which is induced by the repeated action of any organ, whether internal or external, whether muscle or brain; of the change in the substance of the brain attendant upon higher mental development—a change in bulk and complexity; and, last of all, the discovery of the provision for the consentient or consilient action of different organs of the body, by the coördinating agency of the great nerve centres, which tendency can be greatly augmented and modified by culture and habit. These physiological facts, combined with the doctrine of the association of ideas, which is resolved by many into the physical coaction and coalescence of nerve movements and nerve cells, are the data or materials out of which the Cerebral Psychologists construct their science of the human soul. Some cerebralists venture to avail themselves of the as yet partially established doctrine of the correlation of physical forces, in support of the conclusion that mind, or soul-energy, is but the spiritual correlate or metamorphose of so much brain or nervous energy. Many of these views are ably represented in the works of Professor Alexander Bain, of Aberdeen, entitled *The Senses and the Intellect*, and *The Emotions and the Will*, also, *Mental and Moral Science*, etc.

The facts and phenomena recognized by the cerebralists are true and important. The most of them should be recognized in anthropology, or the science which treats of the relations of the soul to the body. We may even admit that they all deserve to be considered among the conditions of the purely psychical activities. But they are only the invariable antecedents or the essential conditions of these phenomena, so long as the agent which performs them acts also with those which are purely corporeal or vital. There is no evidence that they produce these phenomena; they do not appear among the constituent elements of any psychical state or act; they cannot be found in them by analysis; they do not explain in the least the original capacity to produce them.

The cerebralist theory.

Their theory refuted.

they do not account for the dependence of one of these classes of states upon another, as of memory upon perception, or of reasoning upon both. These cerebral conditions might be supposed to exist, without the occurrence of any of the phenomena in question, without perception, memory, or reasoning. The nervous system might perform every one of its functions without a single psychical result. Its direct and reflex action might occur in every possible form; frequent repetition might increase the flow of nervous energy in certain 'well-worn paths,' and the parts excited might grow in size and strength; new combinations of nerve cells might secure growth to the brain, both in mass and complexity, without the occurrence of a single act of perception, memory, reasoning, or mental association, or without any kind of psychical growth or mental development—in short, without the occurrence of a single one of the phenomena which these causes are supposed to explain, and of which they are supposed to be the scientific equivalents.

Moreover, these professed explanations have neither meaning nor application except as they suppose the mind already to possess a knowledge of psychical phenomena as known by consciousness, and as connected by certain scientific relations which are purely psychical in their origin and authority. The cerebralist talks, like every other man, of perceiving, of being conscious, of remembering, of induction, and of reasoning, as though he understood himself, and expects to be understood by others. He proposes, as problems to be explained, these phenomena as dependent on and connected with one another in the experience of human consciousness. Of these facts of consciousness he continually avails himself, to give meaning and significance to his cerebral analysis. In short, he supposes a science of the mind's inner experiences which he proposes to supplement by facts or laws of sense-observation, using the facts to be explained to interpret the facts which explain them. Should he attempt to use the nomenclature of his own science in place of that given by the science founded on consciousness, he would fail to be understood. The one cannot be a substitute or an equivalent for the other. The excitement of a nervous organism does not and never can be made to signify the same thing, as to feel, to know, or to will; its excitement a second time can never be the equivalent of to imagine, or to remember; the partial excitement of many nerves or nerve-products, limiting or helping one another, can never signify, *to reason*. Indeed, the very phrase cerebral psychology seems to be self-contradictory and self-destructive. *Cerebral* can relate only to the brain. *Psychology* would intimate that there is a soul which is other than the brain. Should the cerebralist reply, that the appellation is none of his own choosing, it might still be said in answer, that, by whatever name it is known, cerebralism professes to be a science of the brain and its functions, both vital and psychical. But a science, supposes a knowing agent, and a knowing agent is something other than a throbbing brain; and to know even the functions of the brain, especially after a scientific method, must surely be something more than for the brain to exercise a function in respect to itself and its own functions. Such a conception is more incredible and inconceivable than the conception, which is so often stigmatized, of the soul as conscious of its own operations. A soul that is self-conscious is not so singular as a brain functioning about itself and its own being. No definition of self-consciousness given by the metaphysicians can compare in absurdity with that which the cerebralist is compelled by the terms of his system to give of the knowledge which is the subject-matter of his own science.

§ 42. The so-called phrenologists constitute a distinct branch of the cerebral school, if, indeed, their doctrines have not been superseded by the more exact and comprehensive knowledge of the brain, on which the cerebralists build.

To the claims of the phrenologists to have established a science of the soul, the following objections may be urged: 1. They have not proved that the protuberances of the brain, or the cranium, on which their science is founded, correspond to the psychical powers or functions which it is claimed they decisively indicate. 2. The classification of these very psychical powers which they adopt is illogical, inasmuch as it is chargeable with not a

few cross divisions. 3. The classifications and arrangements of the whole science rest for their verification on the knowledge of the soul which is given by consciousness. It requires this knowledge to supplement its observations of the cranium. It is this knowledge which furnishes all the facts which are to be explained, and is the test of the correctness of the classifications. Were phrenology established, it would not be a science of its own facts; it would serve only as a guide in the use of certain external indications as explaining the psychical characteristics of individuals.

The question may properly be raised at this point, whether the brain is not the organ of the soul, and whether the cerebralists are not justified in treating it as such. We reply, that there is an important difference between asserting

that the brain is the substance of which psychical processes are the functions, and the very general statement that the brain is the organ of the soul. This, when properly explicated, would seem of itself to imply that the brain is one substance and the soul is another, each having proper features and functions of its own. To say that the soul, so long as it exists with its present corporeal environments, uses and depends upon the brain as its organ of communication with the material world, and sympathizes with the physical condition of the brain in its capacity to act with effect, is to say no more than the truth. This dependence and sympathy may hereafter be established in a multitude of particulars which have not yet been discovered. The brain might itself be subdivided into special organs, and for each of these a separate and as yet unknown function might be ascertained. The relations of these organs and their functions to the powers and acts of the soul might be traced out with surprising minuteness, and still the brain would be no more nearly proved to be identical with the soul itself.

§ 43. The Associational Psychology represents still another theory of the science of the soul. It is founded, as its name imports, upon the fact or law recognized by all psychologists, that the ideas or acts of the soul that are often united tend to recall one another more readily. This law is applied by this school to take the place of every other law or condition of psychical activity, and to exclude every other power or capacity. It is made to stand in the place of the so-called faculties, and even to explain the origin of all necessary and intuitive truths. The school numbers many adherents, among whom are conspicuous Hobbes, Hume, Hartley, Bonnet, James Mill, John Stuart Mill, Bain, and Herbert Spencer. Some of these are more consistent and extreme in their conclusions than others, but all may be fairly said to adopt the associationalist theory in its principal features. These common features are the following. They hold, 1. That a psychical state is analogous to a change or effect in a material object as being a simple impression, or changed condition which is simple—not complex, as is claimed by those who find in every such state a conscious relation to the *ego*. They hold, also, that it is necessarily produced by its cause, condition, or object. They deny, distinctly or impliedly, the truth that every state of the soul must be performed by the conscious *ego*, and that in many of these states this *ego* is consciously active, and in no sense passive. 2. They teach that every such state thus necessarily produced and passively experienced, tends to be reproduced with its attendants. 3. A reproduced state, unless in some way reinforced, as by similar conditions, of itself tends to be and is reproduced with an energy that is weaker than that of the original. (Of Hume, Bain, and Spencer.) 4. If it is often reproduced and is reinforced in every act, its energy is greatly increased. This increased energy is manifested subjectively by its stronger tendency to recur again, and the greater vividness with which the object is presented to the mind. Herbert Spencer has given great prominence to this doctrine in the special application which he makes of the repetition of acts of which we are at first distinctly and perhaps painfully conscious, and which we learn to perform with an almost mechanical readiness. He insists that the facility thus acquired becomes literally mechanical, and that the acts in question pass entirely out of the domain of consciousness, and are taken up by the passive energies,

first of the associational faculty, and then of the brain and nerve-cells. In this way they become the material for propagation, through transformations of the nervous substance which are transmitted from one generation to another. A few physiologists who are not of this school account for the phenomena in question by what they call processes of 'unconscious cerebration.' Every activity of the mind not occasioned by some new or original material impression, is the action or product of this tendency to recurrent action, either weakened or strengthened in whole or in part. Imagination is a weakened impression. An act of memory is a somewhat stronger and recurring activity, bringing up a more perfect reproduction of the past. Generalization is a more vigorous revival of some part of many original impressions, which is capable of being suggested by each of these originals or their parts, and made common to them all. Judgment and induction are similar experiences of partial elements of more widely ramified impressions. All these processes are reduced to the more vivid experiences which result from many similar impressions; never to the discernment and affirmation of similarity in the parts of each of the objects to which they belong. Similarity itself, as the ground and motive to the classification and interpretation of nature, is only the result of two or more passive impressions, and never an intelligent cognition or judgment. It is not an objective fact of relation knowable by the intellect, but a subjective sensation or impression more or less frequently recurring.

The belief of necessary truths or fundamental relations, is the result of the frequent conjunction of similar experiences made inseparable by repetition.

Explanation of necessary truths. Thus, the relation of causation is resolved by Hume into the customary connection of ideas or objects. Thus, J. Stuart Mill resolves the belief in any necessary truths, even the simplest mathematical postulates or axioms, into "inseparable association," and gravely suggests that their opposites would be and appear just as axiomatic to a community differently trained. Thus, Herbert Spencer, in his *Principles of Psychology*, resolves our *a priori* convictions concerning the reality of space and time, and the relations which they involve (for the necessity of which, as realities, he contends, against Kant and Hamilton), into the invariable conjunctions which first created a persistent tendency to recurrence, which tendency was fixed and confirmed forever by being propagated through countless generations of human beings till the inseparable association turns out to be a necessary and *a priori* truth, of which it is impossible even to conceive the negative.

It is necessarily implied in this theory that it dispenses with what it calls the scholastic doctrine of separate faculties of the soul. This, indeed, is its pride and boast, that it makes these several faculties to be but varied forms of the single tendency or law of association.

The fundamental defect, the *πρωτον ψευδος*, of the associational school, consists in this, that it does not distinguish between those activities of the soul by which, so to speak, objects are prepared for and presented to the soul for its varied activities, preëminently that of knowledge, and the activity which the soul performs with respect to them when so prepared and presented. An impression on the sensorium, even when responded to by reflex nervous activity, is not the act of knowledge by which the mind distinguishes the object from itself and from other objects; nor does the tendency thereby created to its repetition explain the act of imagination or memory with respect to it when represented a second time. A similar impression, in whole or in part, is a very different thing from that apprehension of a whole or part as similar which is essential to generalization and reasoning as acts of knowledge. The constant conjunction of two ideas, as a consequent of which the one will always suggest the other, does not explain the relation under which the mind connects them in an act of judgment; least of all the relation by which it joins them in those beliefs which are necessary and intuitive, as are those which concern the relations of space, time, causation, and design.

It is worthy of notice, that though the associational school is plausibly successful in its explanations of the lower activities and products of the intellect (chiefly, however, because

philosophers as well as critics overlook the intellectual element which belongs to them), they fail most signally in explaining the higher operations. J. S. Mill supplements the functions of the associational power in his theory of reasoning and induction by resorting to an 'expectation concerning the uniformity of nature,' which neither association nor induction can account for. Bain resorts to the emotional nature to explain belief, and Herbert Spencer must fall back upon the growth of two nerve-cells into one, propagated indefinitely through successive generations, to account for *a priori* and necessary beliefs.

The associational school can only explain the higher processes and products of the mind by explaining them away—by making them, under the pressure of its theory, to become something else than what they are. Its theories and explanations are plausible, because the single principle on which they rest is so nearly allied to the pervasive law of attraction, which is so potent in mechanical and chemical philosophy. The extensive and ready favor with which they are received as the only truly scientific theory of the mind, is but a single example of the power of materialistic analogies and prepossessions in the judgment of spiritual facts and relations.

Usually Materialistic. The associational theory, though in its fundamental principle not necessarily materialistic, has been uniformly received by the cerebralists, especially by the cerebralists of the modern school. The doctrine that every mental process is the result of the association and blending of ideas, when united with a principle which explains association by the conjunction of nerve-cells into nerve-growths, and the consequent increase of nerve activities by the increased energy of nervous stimuli, commends itself as demonstrable, reasonable, and true to all those who find in the movements and growths of the brain the scientific explanation of psychical processes. Bonnet, Hartley, Bain, and Herbert Spencer impliedly, are eminent examples of the union of both cerebralism and associationalism in the same scientific theory.

Theory of Herbart. That the associational psychology is not necessarily materialistic, is proved by the theory of John Frederic Herbart concerning the science of the mind. Herbart is at once a most decided, and, it might be said, an extreme and even bigoted spiritualist, and also as extreme an associationalist, in the consistent and thoroughgoing use which he makes of the law of association. No psychologist of ancient or modern times is so earnest in his polemic against the faculties of the soul, none so subtle in his attempt to resolve all psychical phenomena whatever, by the positive and relative tension of ideas, whether present or absent; i. e., whether striving to retain or to regain their footing within the bounds or over the threshold of consciousness. Most of all, none is so daring and persistent in the effort to give expression to these forces of ideas by mathematical formulæ. His mental static and dynamic—i. e., the static and dynamic of ideas—are all computed and expressed by mathematical formulæ. Herbart, though an extreme spiritualist, is as eminent an associationalist.

The principal features of Herbart's psychological theory, stated without the metaphysical doctrines from which they are partially supplemented and derived, are the following. The soul is not only spiritual, but simple; so simple, that it cannot be conceived of as endowed with diverse powers, or as capable of any internal actions, reactions, or developments. As spiritual it can hold no relations to space. It is simply capable of a persistency of independent life, which leads it to resist any disturbance or action from without by a series of reactions which vary according to the objects from without which provoke them. These reactions of the soul are ideas. The force with which they are produced is, or involves, a tendency to maintain their being. As the mind is disturbed and impinged by many objects, so the number of its reactions or tendencies to reactions, is very great, and hence the soul becomes an arena for the actions and interactions of these ideas, dormant or revealed. Of these reactions, the similar aid and the dissimilar hinder one another. Precisely here, comes into play the associational psychology, involving many of the inferences to which it is applied by its advocates belonging to other metaphysical schools. The doctrine of faculties is rejected. The conceptions of time and space as psychological products, are the resultants of many past images arranged around the present experiences as central nuclei, according to their various degrees of vividness and faintness in a line or a superficies, the vividness and faintness being determined by the helps and hindrances of other states. The *ego* of self-consciousness is simply a complex of past mental experiences as recalled by memory or pictured on the imagination, that is, as helped or hindered,

more or less, by the parts and wholes of other states, and somehow made an object to a present mental state. The self is a congeries of these remembered products of the mind's past activity, regarded as the manifestation and measure of the soul's energy and character. Judgment and reasoning are accounted for as by the English associationists, except that Herbart draws on his logic and metaphysics as independent authorities to help out and correct his psychology, instead of developing, after the manner of the English, his logic and metaphysics from his psychological analyses. Psychologically, Herbart is an associationist in the principles of his system. His system is in part adopted by J. D. Morell, in his *Introduction to Mental Philosophy*. London, 1862.

§ 44. The Metaphysical, or, as it is called by some, the Constructive theory of the science, remains to be noticed. This assumes that psychology can become a science only as it is expounded in the spirit of a system of speculative philosophy which is first assumed or proved to be true, and which must be established as true, before the study of the mind can be made truly scientific, or even before it can begin. There is a truth in the assumption, that every special science is only so far scientific as it rests upon true metaphysics. But there is an important difference between the correct and adjusted statement of this underlying philosophy in a perfected system, and the recognition of these truths in their concrete applications without the aid of such a system. If the metaphysics are valid and true to nature, they must be followed in the main even by the man who has not formulated their principles into an abstract system. One cannot easily deviate from them if he is earnest in his desire for truth. There is also an important difference between the teacher or student who is so fixed in the conviction *a priori* that his philosophy is true, as to be incapable of observing or doing justice to those facts which are not required or supported by it, and the one who considers and records facts as he finds them, whether they do or do not square with his philosophy. In psychological studies the temptation is particularly strong to view the facts in the light of some preconceived and half-learned philosophy; but it ought for this very reason to be more vigorously resisted. It is in the order of nature that the study of metaphysics should follow after the study of the mind, inasmuch as it is in the analysis of the power to know, that we are supposed first to discover what it is to know, and especially what are the objects and relations which are essential to science; in other words, what conceptions and relations are philosophically valid as the axioms and postulates of scientific knowledge.

§ 45. The philosophers of the modern German schools are, as is well known, more distinguished as philosophers than as psychologists. The object of their inquiries has been too often to construct a consistent and plausible system of metaphysical philosophy, rather than to discover or expound the processes and the laws of the human soul as given in human consciousness. Their writings abound in acute and valuable psychological observations of this kind, but they are generally incidental to their main purpose. Kant, in his *Critique of Pure Reason*, has given an almost complete system of psychology, but it is incidental to the discussion of his main inquiry, 'Are synthetic judgments *a priori* possible?' One does not need to read Kant with extraordinary care to be convinced that his psychology is constructed in the spirit of a preconceived theory, and that, true to nature and fact as he was, he would have done far more for psychology had he made it the chief object of his studies; and yet Kant is more psychological than those of his successors who are usually named as the *coryphæi* of German philosophy. Of all these writers it is emphatically true that their attention has been given primarily to metaphysics, and only indirectly to psychology. Their disciples have, in many cases, written upon psychology proper, and the treatises of each are, as might be expected, composed in the spirit and service of the philosophy of his master. Hegel is, perhaps, the only one who professes to have constructed a psychology as the legitimate outgrowth or logical product of his metaphysical system, and the results should serve as a decisive warning against imitation. In this system, the existence, the nature, the powers, the operations, and the products of the soul are all set forth chiefly so as to illustrate the great principle of his metaphysical system, viz., the develop-

Metaphysical or
a priori Psycho-
logy.

Psychology of
the German
schools.

ment of the concept through the force of the necessary movement of thought into all the forms of existence which the universe of matter and of spirit have attained. That is to say, the soul is conceived to be just what it ought to be, according to the ideal of this logico-metaphysical system. The proof that it is such, is found in the fact that it is rational for it to be so, because this is provided in the dialectic process common to being and thought. There is little necessity that there should be any consideration of facts or phenomena. Indeed, facts are scarcely considered at all, but only the metaphysical relations of the psychical powers and processes. These scientific or necessary relations are assumed to have been pre-determined by the more comprehensive view which Philosophy had taken of the laws that govern the evolution of the universe. This being fixed, all else follows of course, by a necessity which is both natural and logical,—the two in Hegel's system being identical.

So far as Hegel himself is concerned, or any other philosopher who assumes to have attained so comprehensive a view of the system of the universe, it may be legitimate and natural for him to derive from it the science of the soul by a strictly logical process. But even his success would not compensate for the failure to notice and describe the psychical facts which might still further confirm and illustrate the metaphysical system which claimed to be universally applicable, and demonstrable from the nature of thought. If it be supposed that these facts were completely at his command, and that they all harmonized with his fundamental philosophy, it cannot be assumed that they are equally familiar to the learner, or that they are known by him adequately at all. As known by him and as learned by him, they ought not at first to be set forth as illustrations of a philosophical system, or even as proofs of its truth and consistency. They should be traced and learned in the cautious and painstaking way of induction, till they carried him up to the height of speculative observation where the philosopher stands, and from which he constructs his psychology. The beginner in psychology must begin with the elements, because out of these very elements he must evolve the system which he may afterward use when he attempts to construct the soul by a synthetic process. But he may not begin with the completed system itself, because in so doing he violates the psychological order of acquisition, which requires every one to go from the concrete upward to the abstract, and to find for himself, under wise guidance, the general and remote, in the concrete and the near.

To pursue the reversed order, is to weaken the certainty of knowledge, as well as to confuse and embarrass the mind of the student. Such an error of method is certain to be revenged on speculative philosophy itself. It opens the way for the most fantastical dogmatism on the part of the teacher; for, as soon as he is emancipated from the necessity of justifying his speculative system to the consciousness of his learners by the facts of inner experience, he will be tempted to be positive when he is not certain, and to be fantastic when he is neither logical nor clear. It breeds haziness and pretension on the part of the student. In attempting to follow a guide who deviates from the order of nature, his steps cease to be confident and firm. The want of clear insight he will supply by pretension and conceit, which are both parent and offspring of credulity and dependence.

No maxim deserves to be recorded by the student of philosophy in letters more clear and bright than this: 'The man who seeks to enter the temple of Philosophy by any other approach than the vestibule of psychology, can never penetrate into its inner sanctuary; for psychology alone leads to and evolves philosophical truth, even though it is itself subordinate to philosophy. Moreover, he who attempts to construct psychology by the aid and under the direction of a metaphysical system, contradicts the order by which both psychology and philosophy are developed and acquired.'

THE HUMAN INTELLECT:

ITS FUNCTION, DEVELOPMENT, AND FACULTIES

A PRELIMINARY CHAPTER.

WE have considered the soul as capable of various functions or operations, which are manifested to consciousness as psychical facts or phenomena. We have defined *the intellect* to be the soul as endowed with and exercising the power to know. We now proceed to make the intellect the special object of our study. In other words, we enter upon that special division of psychology which is concerned with the capacities, operations, and laws of the human intellect.

Knowledge defined. What is it to know? § 46. The distinctive function of the intellect being to know, we at once inquire, 'What is it, for the soul to know?'

Consciousness has already taught us to observe ourselves in the act of knowing, and to distinguish this condition from those which are coördinate with it, viz., the states of *feeling* and *willing*. For this conscious experience there can be no substitute. No definition or description can convey, to him who has never *known*, the conception of what an act of knowledge is. All definitions and descriptions presuppose that the person to whom they are addressed can understand their import and verify their truth by referring to his own conscious acts. But we may not rest in this general assent to the reality, nor in our general impressions of the nature of knowledge. We require a more exact determination of its import and relations.

The nearer and more attentive consideration of knowledge gives us the following propositions:

To know, is an active operation. 1. To know, is an operation of the soul acting as the intellect—an operation in which it is preëminently active. In knowing, we are not so much recipients as actors. We do not merely submit to the impressions which are made upon the senses or the mind from without. Nor are we the passive subjects of the mechanical operations of ideas already acquired, as they come and go by an independent force and movement of their own, as they intrude, break upon or elude the memory and fancy in seeming caprice or wantonness. We do not generalize, reason, or believe, according as certain relations do or do not choose to suggest themselves. But in all states of knowledge the soul

itself energizes or acts, in the ways or methods which are provided for by its original endowments.

2. The intellect exercises its capacity to know under certain conditions. Like every other agent in nature, it is limited in respect to the mode, energy, and results of its action, by the occasions and circumstances under which it acts. As fire cannot burn without fuel to consume, as water cannot wet without something to moisten; or better, as oxygen cannot produce an oxide without some base with which to combine, so the intellect cannot know, unless there is something to be known.

Thus the intellect cannot perceive a color, a taste, a tree, a house, when these objects are not presented to the mind, for it to act concerning or upon. So, too, it cannot remember, unless an event has occurred which it may proceed to recall and recognize. Nor can it imagine or believe, without certain materials or data with or from which, it creates or infers. While, on the one hand, the intellect, in knowing, must act or operate upon, and in some sense create, its products, it cannot produce results at its will, but it must be governed by the objects which are furnished, as to what it knows and as to how it shall know them.

The conditions enumerated are objective only. There are also conditions which are subjective, as the mind's capacity to know, which is always assumed; its disposition for present activity, its bodily conditions of health and reason; also certain favoring circumstances, as absence of preoccupation; and, last of all, the direction and fixing of the attention to the so-called objects.

3. The objects which condition the acts of the intellect are diverse in their character. Some are presented from the world without: such are the objects of sense, for the existence of which, their adaptation to the sentient organism, and their coming within the range or reach of the power to know, the soul itself may be in no way responsible. Others are presented from within, the soul creating by its own activity the very objects, and the whole of the objects, on which it exerts the activity of knowing: such are the operations of the soul itself, in the various forms and the endless variety of the states of knowledge, feeling, and will, all of which are apprehended, as objects, by consciousness.

Other objects are the products or results of precedent acts or energies of the soul, as objects of sense previously perceived and waiting to be remembered; the so-called images and pictures once present and seen, but now absent and unseen. There are also the conceptions or notions which general terms represent and recall, and which language holds ready for the intellect to understand and recognize: these are the contingent and necessary relations in objects themselves, which must be supposed really to exist, in order to be known.

It is manifest from this enumeration that the word *object* is used in two widely divergent senses—either as the external or material object, the *object-object*, as it is often called, and which may be explained as the object eminently objective; and the *subject-object*, i. e., the mental object, or the object created by the mind's own energy. The adjectives *subjective*

and *objective*, also, follow the widest or most generic meaning of the word *object*. *Objective* is applied to whatever the mind contemplates as an object, whether it be a *subject-object* or an *object-object*. Every relation which such an object holds is called *objective*. On the other hand, *subjective* is applied to the knowing mind, whether it is conceived as apprehending a *subject-object* or an *object-object*; a material object, as the existing moon, or the moon pictured by the mind for the mind's eye. *Subjective* is also applied to all the psychical experiences and acts; to the feeling and willing, as well as the knowing soul.

The process which prepares objects of knowledge. § 47. 4. Inasmuch as we assume that the soul can create objects for itself to know, as in the cases already referred to of consciousness and memory, we ought carefully to distinguish all that activity of the soul by which objects are, so to speak, *prepared* for the mind's cognition, from the activity consequent thereto, viz., the special activity of the intellect in knowing. For example, the energy of the soul in what is called the *association of ideas*—by which, on occasion of the presence of an object known, another object presents itself in order to be known—is clearly distinguishable from the act of the intellect in apprehending that object when presented. In like manner, all the antecedent preparation by which material things are made ready to be known through the agency of the spiritual element in the sensorium, is plainly diverse, and ought to be distinguished from the act of the mind in perceiving the object when thus made ready. The creative energy of the intellect in the construction of mathematical conceptions, as well as in the higher acts of invention and discovery, is a more interesting example of this peculiar power.

These two kinds of activity are so intimately connected, that they seem to be united and to blend into one. They have not been distinguished so sharply as they ought to be. By many writers they have not been separated at all in the analysis of knowledge. It is obvious, however, when the act of knowing is precisely defined, that it is properly distinguished from this work of preparation and the powers and operations which it involves. The advantage of thus separating it will occur to every one who follows its applications, or who is conversant with the too common want of precision in conceiving and defining the faculties and operations of the soul.

The consideration of these acts or processes suggests the possibility of many endowments in the soul, which though psychical in their nature, are not fully open to consciousness. Of these there are two classes, (1) those by which the soul cooperates with matter, i. e., living matter, in, so to speak, providing sense-objects, and (2) those in which it acts by processes peculiarly psychical, as in the reproduction to imagination and memory of states or objects previously known. The first are sometimes called *psycho-physical* in contrast with the psychical.

We observe also, that these acts or functions of preparation, are generally, not conscious acts, in the sense in which the acts of knowledge are. Some of them may be wholly removed from consciousness, as in the activity by which the soul preserves and suggests objects once known, while yet these very acts or operations largely depend on the conscious operations. Some of these may be entirely removed from consciousness, as the physiological or *psycho-physical* operations which conditionate sense-perception. Others may be almost or apparently quite within the range of conscious observation, though performed with rapid and spontaneous exertion.

They are all properly psychical acts, and are appropriately treated in connection with those activities with which consciousness has to do. We cannot understand these activities without constant reference to them.

Let us then suppose that the conditions of an act of knowledge, both subjective, objective and psychical, are all fulfilled. We are prepared to inquire what is involved in the act of knowledge that supervenes,

To know, implies the certainty of being.

§ 48. 5. To know, is to be certain that something is. When the conditions of the act are present, the act occurs. In the act of knowing it is involved that the mind should be certain that an object is. Knowledge and being are correlative to one another. There must be *being*, in order that there may be knowledge. There may be being, it is true, which is not known by any created intellect, but there can be no knowledge, which is not the knowledge of being. It is of the very essence of knowledge that it apprehends or cognizes its object to be. Subjectively viewed, to know, involves certainty; objectively, it requires reality. An act of knowing, in which there is no certainty in the agent, and no reality in the object, is impossible in conception and in fact.

Beings or realities differ in their kind.

Here we must distinguish different kinds of objects and different kinds of reality. Objects may be psychical or material. They may be formed by the mind and exist for the mind that forms them, or they may exist in fact and in space for all minds, and yet in each case they are equally objects. Their reality may be mental and internal, or material and external, but in each case it is equally a reality. The thought that darts into the fancy and is gone as soon, the illusion that crosses the brain of the lunatic, the vision that frightens the ghost-seer, the spectrum which the camera paints on the screen, the reddened landscape seen through a colored lens, the yellow objects which the jaundiced vision cannot avoid beholding, each as really exists as does the matter of the solid earth or the eternal forces of the cosmical system.

The existence of one of these objects is not of the same kind with that of the other; their reality is not precisely the same, but they are equally existent objects, and, so far as known, are known really to be.

It is true, one kind of existence and reality is not as important to us as is the other; we dignify one class as real, and call the other unreal. We make one kind of knowledge to indicate another. We strive to look through the shows of fancy and the illusions of sense to the reality of things. We call some of these objects realities, and others shadows and unreal, but, philosophically speaking, and so far as the act of knowledge is concerned, they are alike real and are alike known to be.

The word *being* is sometimes contrasted with *phenomenon*. It is obvious that in that case it is not used in the sense in which we have defined it; i. e., as equivalent to a *knowable object*. When used in such a contrast, we oppose real, permanent, or independent being, to phenomenal, transient, or dependent being. Being, as we use it, is generic, admitting the two species of real and phenomenal being, in the senses explained and contrasted.

We often err in making one kind of reality indicate another. We mistake one kind of existence for another. We confound mental fancies with material things. We think an air-drawn dagger will pierce us to the heart. We believe that the spirit which our distracted phantasy conjures into being, has veritable flesh and bones. But mistakes like these, so far from proving that what we know has no existence, demonstrate precisely the opposite. For how could we mistake one object for another, if the first object did not exist and were not known to be?

We do not *err* in not *knowing* something, but in *mistaking* it for something which it is not. We do not err as to *that* the being is, but as to *what* it is. We do not err as to its

beingness or entity, but as to its relations. When being is used in this generic sense, truth and error are only possible with respect to relations, as explained hereafter.

This point being established, we observe :

Also the reality of their relations.
 § 49. 6. In knowing, we apprehend not only that objects exist, but also that they exist in certain relations to other objects, one or more. Hence it is essential to the definition of knowledge not only that we know objects as existing, but that we know them as related. We cannot know even two thought-objects as being, without also knowing that the one is not the other. We cannot notice two leaves, without knowing that they are alike or unlike in form, surface, or color. We cannot observe two occurrences without referring them to the same or different causes, etc., etc. The variety of relations is too great to be enumerated here. We desire only to call attention to the general truth, that a relation is discerned in every act of knowledge.

Objections.
 To this assertion several objections may arise. It may be admitted that we discern relations in many acts of knowledge, but not in all. Least of all, it may be contended, does it enter into the conception of knowledge that we should know some relation. It may be urged that the logicians distinguish simple-apprehension from judgment—simple-apprehension being defined as the cognition of an object, and judgment as the pronouncing that one object is in some relation to another. To this it is sufficient to say, that these same logicians usually distinguish the objects of simple-apprehension into complex and incomplex, the one being one or many objects as apprehended without, and the other the same as apprehended with, or in some relation; showing by their very definition that simple-apprehension sometimes admits relations.

It may be urged still further, that many psychologists have distinguished knowledge as perception, consciousness, memory, and imagination, on the one hand, and as judgment or thought on the other; the first class of acts giving *being* of different kinds, or the matter of knowledge, and the second class giving its forms or relations.

The truth admitted directly and indirectly.
 On the other hand the most acute and discerning have not failed to see and to confess that judgment, even though it is distinguished from the lower kinds of knowledge, must accompany them all. Dr. Thomas Reid observes, "In persons come to years of understanding, judgment necessarily accompanies all sensation, perception by the senses, consciousness and memory, but not conception." This denial of judgment to conception [the simple-apprehension of the logician] is qualified by Sir William Hamilton in a foot-note, thus: "In so far as there can be consciousness, there must be judgment."—*Hamilton's ed. of Reid's Works*, p. 414. Reid observes again: "The first operation [simple-apprehension] may be exercised without the other two [viz. judgment and reasoning]. It is on that account called simple-apprehension, that is apprehension unaccompanied with any judgment about the thing apprehended." Upon this Hamilton remarks in another foot-note: "This is not correct; apprehension is as impossible without judgment as judgment is impossible without apprehension. The apprehension of a thing or notion is only realized in the mental affirmation that the concept ideally exists, and this affirmation is a judgment. In fact all consciousness supposes a judgment. as all consciousness supposes a discrimination."—*Haw. Reid*, p. 248. And yet Hamilton, notwithstanding the subtlety of these criticisms, and the frequency of the concessions which they contain, when he comes to define the Elaborative Faculty, *Met. Lectures*, 20, expressly calls it the Faculty of Relations, committing precisely the same oversight into which Reid had fallen with respect to judgment, both in the conception and the definition of the faculty. Even Kant himself, who would seem to demand all knowledge of relations to the understanding, and deny it to sense and consciousness, yet concedes that these two last have their necessary forms of space, time, and self,—space and time being the forms of the sensitivity, and the synthetic unity of apperception being acknowledged in every act of actual knowledge. But these forms involve relations of time and space when applied to the objects known.

No objects without relations.

It may also be urged that, although it may be true that whenever two objects are known by a single act, they must be known in relation, yet it is not so when the object is single. Of this we observe, that it is impossible that an object should be known singly and apart from every other. A single object must be known by some agent, and it cannot be known by that agent unless the object is distinguished from the agent, and from his act in knowing: but to be distinguished is to be apprehended in the relation of diversity. The attention, it is true, may not be strongly fixed on the relation—it may seem to be engrossed by the object; but the diversity cannot be unknown.

But there is scarcely such a thing supposable as a single object. There is absolutely no such thing actually existent in the world of matter or of mind. Every object or event so-called in nature, every single state of mind, will be acknowledged, when thought of, to be complex, and to resolve itself before the attentive eye into many separable elements existing in relations to each other, and held together as one thing by the cementing force of these bonds. An apple, an orange, a pebble, nay, even a grain of sand, consists of parts not a few, united into one perceived whole. A mental state, however simple, is in its essential nature complex, to say nothing of the special relations of time and quality which distinguish it from every other.

Besides, the so-called single objects, though complex in reality, are rarely, if ever, known or thought of apart from one another. They are almost universally known in some companionship involving a relation.

When it is said that in every act of knowledge we not only apprehend that objects exist, but that they exist in some relation, it is not intended that the objects are first known to be, and afterwards known in their relations, but rather that when they are known to be, they are also known as related.

Least of all is it true that objects are first known apart, and then are brought together in order that they may be discerned as related. Nothing can be farther from the truth.—The object given is always complex. On knowing it, we look at it apart or in its elements, and at the same time view or combine these elements together. The bringing together is involved in the taking apart. The discerning the parts is connected with uniting into a whole. Thus, in the example already given of a mental state, we find it to be complex in the two-fold relation which the operation bears to the agent and the object. We do not find these related elements apart, but bound together in the one mental activity. We do not bring them together, but they are together, when we separate and afterwards re-unite them. Again, we find apart or separate in nature, a hundred men, and we unite them into one as a group or *ima*. We both separate in thought what nature unites in fact, and unite in thought what nature in fact divides.

If knowledge in its very nature involves the apprehension of beings as related, or of beings in their relations, it does not follow that all knowledge must be what is called relative knowledge. *Relative*, as contrasted with *absolute* knowledge, means something very different from the knowledge of beings and their relations, or even the knowledge of the relations of beings. Absolute knowledge is consistent with the knowledge of the relations, or rather it is a complete and independent knowledge of all possible and real relations. §§ 688, 696.

But what is a relation? It is natural to ask this question, and it may be said that an answer is needed in order that we may understand what it is to *know*. We answer, The term is one of the most generic or abstract terms of the language, and, like *being*, is incapable of a definition by a term more generic than itself. It can only be made intelligible by examples of relations in the concrete. Etymologically, it carries us back, for its origin, to the act of referring, or carrying back. To refer, is to connect in thought—to know or think two objects as united together. From the act of referring, the word passed over to the effect wrought by the act, to the union effected. From this signification the transition is natural to another—to that common something in the two objects by which the mind can view them as connected into one. This is sometimes called the *fundamentum relationis*. (Cf. Hamilton, *Metaphysics*, App. v. c; also Mill, *Logic*, B. I. c. iii. § 10.)

To determine what a relation is, we must consult the power of knowledge itself, as it is manifested in its acts and products. This question is closely connected with other inquiries; as, How many original relations, or *fundamenta relationis*, are there, and how are these

applied? To answer all these inquiries, we must ask subjectively, What are the several relations under which the mind connects the objects which it knows? and objectively, What are the bonds under which they are connected when united by the mind's activity? The intellect itself answers our questions by actually connecting objects in these various ways. To ask, What is it to know? is to ask what the mind does when it knows. If we find that, whenever it performs this act, it originates these relations and applies them to beings or objects, we have received the only answer to our question which we can possibly receive, or which we can reasonably expect or desire.

Knowledge of two forms. Analysis and synthesis.

§ 50. 7. To know, involves two comprehensive acts, each of which corresponds to the other—the act of separation, or resolving objects as wholes into other objects which compose them as parts, and the act of uniting or combining the parts into their wholes. These acts are technically termed *analysis* and *synthesis*, and they are present in every form and variety of knowledge.

In *analysis* the mind apprehends separate beings or entities. In *synthesis* it connects them by some relation. Analysis and synthesis accompany one another in almost every act of knowledge. In sense-perception the different parts of material objects and the objects themselves, are first distinguished and then united under relations of space and time. In consciousness, they are connected as coexistent, successive, or produced by the active *ego*. In imagination they are separated and reunited under these and additional relations. In thought, or intelligence, they are again divided, to be re-combined as constituents of general notions or conceptions, of judgments, arguments, inferences, and systems. Thought, too, tends from lower and narrower unities to those which are higher and broader, bringing, if it may, all knowledge into the unity of common properties, powers, laws, and ends.

Objects and relations different and numerous.

§ 51. 8. The objects which the mind cognizes, and the relations under which they are known, are diverse in kind as well as numerous in quantity. There are objects mental and

objects material, and also the constituent elements of each. Among material objects, there are the countless varieties of things, and their manifold sensible elements or qualities. Among mental objects, there are different spiritual states, as knowing, feeling, and willing, with all their possible subordinate varieties. Of relations, there are relations of diversity, of similarity, of number, of time, of space, of cause, of design, etc., etc. This variety of objects and relations is discerned by the mind's own power to know; and the capacity directly to discern these original differences in both objects and relations is an original and necessary property of the faculty of knowledge.

To these propositions almost every person will at first give unquestioning assent. On second thought, the question might arise whether *beingness* must not be the same in every thing known; and, if so, how can it be possible that, so far as these are beings, there should be different kinds of beings? This question may be answered by another, whether relation-

ship, or relatableness, is not the same thing, so far as it is and is known? and, if so, how is it possible that there should be several kinds of it? It should not be forgotten nor overlooked that both conceptions are generic, and denote *abstracta*, which admit, in the concrete, diversity of kinds or species. (Cf. § 391.)

When is the process of knowledge complete?

§ 52. 9. The process or act of knowledge is complete when it is matured into a product, and the product itself becomes an object to the mind's future knowing. Sometimes the whole of a mental state becomes such a product; at other times some one element of a single mental state is detached from the act that produced it, and becomes endowed, so to speak, with a separate life. This product, so far as it exists, exists as a mental transcript or representation of the original, whether that original were a *subject-object* or an *object-object*, and is capable of being recalled, and of itself recalling the original, whether it were material or spiritual.

The term *product* must of course be interpreted by the nature of the producing act. The producing act is, as has been already defined, an act or operation of apprehending being, in a relation or in relations. When a being or object—one or more—is so apprehended as to be recalled, then does it become a product or an acquisition in the sense intended. The product of the knowing operation is an object as known to be. That a certain energy of the operation is essential to this consequence or effect, is attested by experience. How it is possible to separate a part of a mental state so as to make of this, and this alone, a retainable or representable product, will be explained hereafter.

The power of producing such reproducible and permanent results is essential to the perfection and the utility of the act of knowing. It is so essential, that upon it depend the simplest acts of the memory and the imagination, without which the mind would be limited to the transient present, and could neither gather instruction from the past, nor apply wisdom to the future. The higher processes by which man explains the powers and laws of nature would otherwise be impossible, and the capacity to use these powers and to apply these laws in any practical service would be excluded altogether.

The knowledge which is thus separated from the original activity is called representative knowledge, with reference to the original act of acquiring, and mediate or represented knowledge, with reference to the original objects known. The objects thus provided are called acquired or positive knowledge. The power to acquire, *i. e.* so to know as to provide such objects, is clearly distinguishable in thought from the power to know. In fact, the power to acquire, depends on the perfection and energy with which we know.

In all activity, it is not easy to separate, by relations of time or by conscious notice, the producing act from the produced effect. The *doing* becomes a *deed*, the *causation* an *effect*, by transitions, the lines and shadings of which cannot be always sharply drawn. This is preëminently true of all mental activity and production. We need not be embarrassed by this plain fact of experience, or by the distinctions which it involves. We are conscious that we perceive a picture or a countenance. We are as well aware that we afterwards recall what we have seen. That which we recall, is the product of our intellectual activity.

The analysis of the product enables us to understand and explain the elements and agencies which make up the process. The product is enshrined in language, and made visible and tangible in action. Very often its existence is forced upon the attention by its prominence in the sciences, the arts, the fashions and manners of the race. Hence the study of all these is often a most important aid to psychology.

§ 53. 10. The same act of knowledge, with similar objective conditions, may be performed with greater or less energy.

The act diverse
in its energy.
Attention.

This greater or less energy in the operation of knowing is called *attention*; which word, as its etymology suggests, is another term for tension or effort, and was doubtless first transferred to the spiritual operation from the strained condition of the part or whole of the bodily organism, which accompanies or follows such effort. This effort is manifested in the more or less exclusive and complete occupation of the knowing power by the object or relation that is to be known. This greater or less effort of attention is followed by the greater or less distinctness, vividness, and completeness in the objects apprehended, and in the objects retained among the mind's permanent possessions, as also by a greater or less facility in exercising a similar activity a second time.

This energy of attention may be directed sometimes to more and sometimes to fewer of the parts of an object, or of the constituting elements of a mental state. For example, when I look at a house, a horse, or a tree, I may be so absorbed with the color as to neglect the form and dimensions of each; or my attention may be equally divided between form, dimensions, and color; or I may be so occupied with a part or the whole of the material object, as to neglect my own subjective condition, whether psychical or corporeal; or (as rarely happens) I may bestow my attention equally on both conjoined. The part or the whole which is thus attended to, is more likely to be separated from its accompaniments and retained for future use.

§ 54. 11. Some beings and relations are discerned by the mind with far greater ease than others. To know, is, as has been stated already, an act of an individual being, and an act which admits greater or less energy of attention. Now, to hold the mind to certain classes of objects and relations, is comparatively easy, requires little or no exertion, and is accomplished with spontaneous facility. To know so as to master an unfamiliar object, always involves effort at the first; and a ready facility can only be attained by frequent repetition.

Some objects
more easily dis-
cerned than oth-
ers.

Why or how this is so, we need not here explain. The causes are partly logical, partly psychological; i. e., partly explicable by the nature and mutual relations of the objects known, and partly explicable by the emotional or active susceptibilities. The greater ease or difficulty of applying the attention to different classes of objects, and for this reason, of knowing them with more or less complete success, can be very largely accounted for by the circumstance, that the appetites, desires, etc., render possible a greater or less interest in these diverse objects. But why a greater or less interest should be spontaneously awakened in one rather than in another in its turn, can only be explained by the ordinances of nature and the constitution of man. The fact is known by universal experience, and is attested by universal observation. It is natural, and soon becomes easy to all men to attend to material objects, up to a certain degree of minuteness. It is comparatively difficult and unnatural to consider closely the experiences and processes of the soul. It is easy to decide upon the comparative length and breadth of two corporeal objects. It is not so easy to apprehend the parts and relations of a mathematical

ical theorem or of a logical argument. The easier and more natural processes are performed by all men. The more difficult and less natural are reserved for the few. For facility in the one, that education which nature furnishes to all, is amply sufficient. For skill and readiness in the other, special discipline and culture, literally great pains-taking, are requisite.

Intellectual development. The psychological order. § 55. 12. This general fact or law of the intellectual constitution explains the nature of *intellectual development* and the possibility of intellectual growth. The easier and spontaneous processes are first performed, and are therefore the earliest perfected and matured. The more difficult and artificial are exercised next in order; and readiness and skill in using them is reached at a later period. The powers of sense and outward observation are first developed, next those of memory and imagination, and last of all, those of reflection, thought, and reason.

As it is with the intellectual processes, so is it with their products. We have seen how the products are related to the processes; that as the mental processes are employed and perfected with energetic attention, so the mental products are evolved in completed perfection, as naturally and as certainly as the ripe fruit or perfected seed drops from the plant or tree which has rightly elaborated its secret processes. It follows, that, as the powers have to each other a relation of natural succession and of necessary evolution, so their products are related in an order of mutual dependence and connection, one looking back and the other forward. Objects of the memory and the imagination have no meaning and no reality, except as they presuppose and require objects of sense and consciousness. General conceptions and universal truths have no import except as they can be applied to, and be illustrated by, individual beings or events, as observed, remembered, and imagined. In this way there comes to be an organic connection among the products of the intellect, corresponding to the organic relations of the several processes out of which they grow. This relation, as it depends on the development of the soul itself, is called *psychological*; as it implies antecedence and subsequence of time, it is called *chronological*. Both these terms are indifferently applied to the subjective processes and the objective results; but as the former is prominent to the attention, it is more frequently used.

The logical relation of processes and products. § 56. 13. Besides the psychological or chronological relation of the powers and products to one another, there is still another, which is more important and fundamental, and that is their *philosophical* or *logical* relation.

We use one kind of knowing to supplement another, and often not only to assist and supplement, but even to correct its operations and results. Thus we reason to conclusions which we cannot observe by the senses or experience in consciousness. We infer results which we cannot try by experiment, and we predict them before it is time for them to occur. We correct rash conclusions, by looking at principles and laws. We deny

assertions, however confident, by employing arguments. We question so-called facts because they do not square with an established theory.

§ 57. We set up a broad distinction between two kinds of knowledge, calling the one empirical and the other philosophical, the one, knowledge by observation, and the other knowledge by principles or reasons. We should remember, when we make this distinction, that in the two there is but one and the same mind which knows; that the same intellect observes and reasons upon the same subject-matter. It follows that the same mind uses two ways or processes of knowing, and that these assist and correct each other. There must, then, be a relation of dependence between the two. The one must be subject to the other, in the mind's own judgment, and according to the ordinances of the mind's own constitution. In other words, the mind that observes, knows that, by thinking, it can correct and aid its own observing, and that the one method of knowing has a certain authority over the other. Not that the one can take place without the other, or that the one can take place so as to dispense with the other. This is contradicted by the facts of the mind's own development. It is refuted by the psychological relation of the two processes which we have just considered. But while one is psychologically necessary to the other, and involved in the other, the one is subordinated to the other in importance and trustworthiness.

Thus, when we analyze a substance, we determine the qualities that are common to its class, and so are enabled to define a general conception, by resolving it into its constituent or necessary elements. We account for or explain a phenomenon which we observe, or a fact of which we hear, by referring to the causes or forces by which it was produced; and these very causes or forces we interpret still further by the laws according to which they act; or we round off and complete the explanation by stating the adaptations to an end or assumed design.

In all these cases we assume that, to know by generalizing, by classifying, by defining, and by assigning causes and laws, is a more complete, a more satisfying, and a more trustworthy method of knowing, than to know by observation, by memory, or by testimony.

As there is an organic relation between these two methods of knowing, there is a corresponding relation between their products. This is the relation of logical dependence or of rational connection. One conception is subordinate to another, as a species to a genus; or one is a property or attribute of another, as a quality of a substance; or one is contained in another, as an element in its definition; or is given as a reason for another, as a proof for an assertion, a premise for a conclusion, a datum for an induction, or a means to an end. Many conceptions and truths are also capable of being united in mutual relations of classification and explanation, as constituents of a system. All these are examples of logical relations in mental products.

The logical relations of the products grow out of the philosophical dependence of the processes from which the products are evolved. But inasmuch as the products are expressed

in language, and are made objective to the mind, their logical and objective relations are more striking and prominent than the subordination of the acts of knowledge to one another when psychologically considered. In other words, the authority of logical or philosophical conceptions and relations is in the last analysis to be found in the constitution of the rational as contrasted with the empirical faculties. But there is this peculiarity in the rational faculty, that it asserts for itself intellectual authority over the lower powers, by asserting for its products, the place of criteria, rules, reasons, and principles for the products of the lower. Hence the objective or logical relations are more conspicuous than the psychological and subjective.

The question has been much discussed, whether one kind of knowledge can be made the judge over another, and especially whether one species—the rational—can be applied or substituted for the empirical, or observing; whether, for example, we ought to be obliged to give reasons for trusting our sense-perceptions or our acts of memory. We have already said that this would be impossible if it were required; because, in order to reason, we must first (i. e., by psychological necessity) perceive and remember. But we may confirm our sense-perceptions and memories by logical or philosophical grounds. It is to be observed, however, that what we confirm or overthrow in the sense-perception or memory is not the empirical, but the logical element; not the observation, but the inference; not the being, but the inferred relation; not *that* something is, but the *what* or the *how* or the *why* it is.

§ 58. 14. The psychological and logical order do not always agree. The order of intellectual growth and of psychological development does not coincide with the order of logical dependence and of philosophical arrangement. That which is last in actual attainment, is first in logical importance. The truths and relations which the mind is the latest and the slowest to develop and assent to, may be those which are fundamental to its philosophical system. The propositions which are found as the results of its severest toil and the fruits of its highest discipline, when found, are made the principles, the starting-points, the beginnings of its reasonings and its investigations. Hence it may be taken as a maxim, that what is psychologically last, is first in logic and in reason.

§ 59. 15. When the mind has attained the command of its higher faculties, and developed the familiar principles and rules which they assume, it applies them to a double use, of explaining and testing its lower faculties and knowledges, and of trying and judging the power of thought itself. Its final act is to apply them in judging the mind itself, and preëminently its higher powers, for the purpose of testing their trustworthiness and examining their authority. It challenges the thinking power, asking what are the laws of its acting, and what the authority of its results. It inquires what are the principles which it assumes, the relations which are ultimate and unquestioned as the objects and means of its knowing. After questioning every other agent in the universe, and judging of its workings, it turns its scrutiny in upon itself, to test the processes by which it knows, and even the very rules and principles which it imposes upon every thing besides, and ever upon itself.

This is the *critical* or the *speculative* stage of the soul's development

These relations
do not always
coincide.

The critical stage
of knowledge.

When it has reached this stage of its history, it has completed the circle of activity for which its constitution provides. It has performed every variety of operation or function which is possible to a knowing being.

Order of intellectual development and growth. § 60. The consideration of the three orders of progress which have been explained in the acts and products of the mind, viz., the psychological, the logical, and the critical, enables us to trace more satisfactorily the growth of the mind through the stages of its normal and complete development. This development begins to be made manifest with the beginnings of attention. Before this, its activities are, as it were, rudimental only. There is the feeble and confused experience of pleasurable and painful sensations, blind instincts impelling to movements as aimless; but no definite experience of good or evil, and no distinct knowledge even of the simplest objects. Of this state, memory preserves no recollection, and concerning it, imagination has no materials out of which to shape an image or conception. From this condition the mind awakes when some object attracts and holds its attention. The infant's power to know begins to be developed when it begins to attend. The idiot is awakened from its imbruted life by the patient appliances which invention, stimulated by love, employs to fix the eye and hold the mind. As soon as the idiot and the infant begin to notice, the vacant countenance for the first time assumes the expression of intelligence, and is lighted with the gleaming dawn of intellectual activity. Attention gives discrimination, and discrimination implies objects discriminated. The first objects distinguished are objects of sense. It is in the physical world that the soul lives for the earliest years of its activity; it is with this world that it is occupied and absorbed. The sensible objects that are first mastered are those which relate to its wants, and generally, so far only as they are related to these wants; first its appetites, then its affections and desires. With the discernment of these objects, in their relation to these sensibilities and desires, begins also the direction of the active powers by intelligence. The sensations and feelings are referred to definite objects, they are restrained by discipline and habit, they are fixed upon one or another as an aim or goal of effort. The will must also come in, to elevate or degrade the affections in their moral life.

But though the attention is at first chiefly occupied with sensible objects, and these prominently in their relations to the sensibilities and the practical wants, it is not wholly neglectful of the psychical operations and the psychical self. At a very early period the body is distinguished from the material world of which it forms a part, and the soul begins to be apprehended as diverse from the body, as soon as the purely psychical emotions, as the love of power and sympathy, or the irascible passions, are vividly experienced. Though the phenomena of consciousness, as distinguished from the phenomena of sense, are not so distinctly attended to as to be separately named or familiarly spoken of, yet a real apprehension of the soul as a special energy, capable of various psychical activities and the source of most important experiences, must very early be combined with the more forcibly discriminated apprehensions of sense.

As fast as the attention masters distinct objects, it must separate them into separable ideas or images, which are henceforth at the service of the imagination and the memory. These reappear in the occasional dream-life that begins to disturb what was hitherto the animal sleep of the infant. Memory begins to recall past experiences of knowledge and feeling. Recognition finds old and familiar acquaintances in the objects seen a second time. At a later period, imagination begins to imitate the actions and occupations of older persons, and furnishes endless and varied playwork for childhood, in the busy constructions of the never-weary fancy; while it irradiates the emotional life with perpetual and inextinguishable sunshine.

Slowly, the rudiments of thinking, or the rational processes, begin to be learned and practised. The attention not only discriminates, but compares. As it compares, it discerns likenesses and differences in qualities and relations. These, it thinks apart from the individ-

objects to which they pertain. It groups and arranges, under the genera conceptions thus formed, the individuals and species to which they belong. To these activities language furnishes its stimulus and lends its aid. Inasmuch as there can be but a limited language without generalization, the infant or child is forced to think, by the multitude of words which catch its ear and force themselves upon its attention; each representing the previous thinking of other men, and even of other generations. But generalization is at best but a slow process, and the mind at first does as little as it can, entering into the meaning of words only just deeply enough to use them as instruments of its convenience or pleasure, and classifying and arranging the objects of matter and of spirit only so far as is requisite for its immediate purposes.

With classifying, are intimately allied the higher acts of tracing effects to causes and illustrating causes by effects. Then, inductions are made by interpreting similar qualities and causes, as exhibited in experience and elicited by experiments. The mind becomes possessed of principles and rules, which it applies in deductions both to prove and explain. The powers and forces of matter and spirit begin to be discerned, as the result of induction and deduction combined. The relations of these powers to their conditions, and to one another, as well as to motion, time, and space, begin to be fixed and definitely stated, and the laws of matter and of spirit are ascertained in a wider or more limited range and application. Science arranges all beings and all events into the order of completed systems, by means of all the processes of thought; and the whole world of nature is recast into a new spiritual structure, under the relations by which thought decomposes and recombines its individual beings and events, as presented to observation under the relations of space and time. Moreover, adaptation and design are seen to shoot golden threads of light and order through the warp and woof of that otherwise pale and lifeless system of nature, which science reconstructs out of blind forces and fixed mechanical laws. The originating and intelligent intellect of the Eternal Creator and Designer is reached, as the first assumption and the last result of scientific thought.

Last of all, thought turns back upon itself, and critically analyzes all its knowledge, and its very power to know. It inquires into and scrutinizes its acquisitions and its assumptions, and challenges its own confidence in its most familiar processes and beliefs. It seeks to justify to itself its acquired knowledge, its science, and its faith, by retracing, under the guidance of logical relations, every step it has taken, and every stage through which it has passed in its development and growth. It analyzes to the utmost minuteness, and abstracts with the extreme generality, till it would seem to destroy the vitality of the thinking agent by the keenness and refinement of its dissections. It lays bare the necessary assumptions, the primary and universal relations, which are acknowledged and acted upon in all observation, in all science, and in all faith. It returns home again from the unnatural course of its speculative criticism, and the constrained attitude of its critical and perhaps sceptical inquiries, to confide a second time in the knowledge and the faith which it could not but acquire and trust in its progressive synthesis, and which it now has learned to vindicate by its retrogressive analysis.

These critical and speculative processes of thought are reserved for but few of the race to prosecute. They are, however, the normal and the necessary consummation of the completed growth of the fully developed man.

§ 61. The consideration of the development and growth of the intellect furnishes the only true principles by which to regulate the culture of the intellect, and to arrange the order in which the different branches of knowledge should be studied.

The studies which should be first pursued are those which require and discipline the powers of observation and acquisition, and which involve imagination and memory, in contrast with those which demand severe efforts and trained habits of thought. Inasmuch, also, as material objects are apprehended and mastered in early life with far greater ease and success than the acts and states of the spirit, objective and material studies should have almost the exclusive precedence. The capacity of exact and discriminating perception, and of clear and retentive memory, should be developed as largely as possible. The imagination, in all its

Order and rules
for intellectual
culture.

forms, should be directed and elevated—we do not say stimulated, because, in the case of most children, its activity is never-tiring, whether they be at study, work, or play.

We do not say, cultivate perception, memory, and fancy, to the exclusion or repression of thought, for this is impossible. These powers, if exercised by human beings, must be interpenetrated by thought. If wisely cultivated by studies properly arranged, they will necessarily involve discrimination, comparison, and explanation. To teach pure observation, or the mastery of objects or words, without classification and interpretation, is to be ignorant even to simple stupidity. But, on the other hand, to stimulate the thought-processes to unnatural and prematurely painful efforts, is to do violence to the laws which nature has written in the constitution of the intellect. Even thought and reflection teach us that, before the processes of thought can be applied, materials must be gathered in large abundance; and to provide for these, Nature has made acquisition and memory easy and spontaneous for childhood, and reasoning and science difficult and unnatural.

The study of language should be prosecuted in childhood, as it is, in fact, in the acquisition of the mother-tongue. In the acquisition of other languages the methods by which the vernacular is learned should be followed as far as is possible. Grammar, so far as it is required, should be simple, plain, and practical. Its theories should be kept in the background, its terminology and principles should be the reverse of the abstract. The contrasts and comparisons involved between the strange and the familiar, will stimulate and guide to the first beginnings of reflective grammar. The memory for words should be exercised and stimulated. Choice tales, poems—narrative and lyric, should be learned for recitation. Natural history in all its branches, as contrasted with the sciences of nature or scientific physics, should be mastered with the objects before the eye—flowers, minerals, shells, birds, and beasts. These studies should all be mastered in the springtime of life, when the tastes are simple, the heart is fresh, and the eye is sharp and clear. The facts of history and geography should be fixed by repetition and stored away in order.

But science of every kind, whether of language, of nature, of the soul, or of God, *as science*, should not be prematurely taught. For the consequence is, either disgust and hostility to all study on the one hand, or, on the other, superficial thinking, presumptuous conceit, and, worst of all, nated curiosity.

The law of intellectual progress involves effort and discipline severely imposed and constantly maintained, but the effort and discipline should follow the guidance of nature.

Principles of classifying the powers of the intellect. § 62. The consideration of the nature and the development of knowledge teaches on what principles we may divide the powers of the intellect, and what is the most scientific ground of classifying them.

In assigning different faculties to the intellect, we do not divide it into separable parts or organs. Such a division is less conceivable of the soul's power to know, than it is of its entire conscious activity. When we say that the intellect has faculties, we mean only that the soul, acting as the intellect, acts under certain conditions in clearly distinguishable operations and to definite and determinable results or products. The consideration of the soul's development determines the conditions of these faculties. The consideration of the logical relation of the products assigns to these faculties their relative authority and importance.

In tracing the development of the intellectual powers in their succession, we do not exclude the co-action of the other so-called faculties of the

soul, as of feeling and will. Their presence and agency have already been recognized with sufficient prominence.

Nor do we deny or overlook the truth, that the several powers of the intellect act together in the earlier stages of its growth, and in both the earlier and later periods of its history both aid and direct one another. The action of a single power of the intellect does not exclude the co-action of the other powers. Yet, on the other hand, it is to be remembered, that as the energy of the whole soul is so far limited that one psychical state is preëminently a state of feeling, another intellectual, and another voluntary, so, in the intellectual activities, one is likely to be predominantly an act of sense rather than an act of memory.

When it is said that one power, as defined, is, in the order of time and growth, developed sooner than another, it is not intended that each lower power is completely or largely matured before the other and higher is used at all, or that distinctly traced boundary lines mark off the several stages of the mind's development. This would involve the absurdity of teaching that the child perceives with the senses for a long time before it begins to remember, and that it remembers and imagines for another long period, before it generalizes and explains. What is asserted is, that sense must begin before memory and thought are possible, and that, as a power, it is perfected before thought has reached its consummation.

Moreover, it will be found to be true in fact, that many acts which we call acts of sense-perception are largely intermingled with acts of representation and thought (§ 166). It will also be found to be true that acts of memory recall past objects under the laws of association which thought makes possible (§ 268); while imagination, in which thought is not largely conspicuous, is scarcely worthy the name (§ 222).

These cautions being premised, we observe that the powers of the intellect are clearly distinguishable by *the order of their development and application, as manifested in the character and relation of their products*. Each faculty is distinguished by the conditions and results of its acting. It is shown to be a peculiar power, by requiring a certain opportunity or means of acting, and by producing certain results.

We have shown already that the products or objects of the mind's knowing are determined by the kind of its acting, and grow out of this acting as its natural result. The several products or objects of knowledge most clearly distinguish the kinds and capacities of knowing, because these, in a sense, are permanent, while the act that produces them is evanescent, no sooner beginning than it is done. The product is preserved in language, and represented by words and propositions. We do not deny that the several modes of knowing are distinguishable from one another in conscious experience. It is certain that to each is assigned a special excitement of feeling. The perceptions of sense give a pleasure or pain which is distinguishable from those of remembering and imagination, and all these processes differ in this particular from the activities of thought. But it is the nature of the objects or products of these activities which furnishes the most distinct and the most easily applied criterion. These, with

the as clearly recognizable conditions of the mind's different ways of acting, may be taken as the ground of our definition and division of the faculties of the intellect.

§ 63. The leading faculties of the intellect are three: *The presentative, or observing faculty; the representative, or creative faculty; the thinking, or the generalizing faculty.* More briefly, the *faculty of experience*, the *faculty of representation*, and the *faculty of intelligence*. Each of these has its place in the order of intellectual growth and development. Each has its appropriate products or objects. Each acts under certain conditions or laws.

Each of these leading faculties is subdivided into subordinate powers, which are distinguishable from one another in like manner with their primaries.

§ 64. I. The presentative faculty, or the faculty of acquisition and experience, is subdivided into sense-perception and consciousness; or, as they are sometimes called, the outer and the inner sense.

In the order of the mind's development these are exercised *first and earliest of all*. The intellect begins its activity with observing objects of sense. Closely connected with this is the observation of the soul's inner experiences, prominent among which are its feelings of pleasure and pain. Not only is this known to be true in fact, but it is impossible for us to conceive that any other order should be followed. The mind must observe before it remembers; for, without something observed and acquired, nothing could be remembered or imagined, because there would be nothing to remember or imagine.

The objects or products with which this power is concerned, or which it evolves, are individual objects. In this respect they are distinguished from the objects of thought, which are always general. But this feature they share with those of memory and imagination, which are also individual. From these last they are still further distinguished by being presented for the first time; hence the epithet *presentative* is applied to the faculty by which they are known. This feature is made still more precise by their relations in space and in time. The objects of sense are fixed in space, being *here*, and the objects of consciousness are fixed as *now* in time. These two relations they share with the objects of no other power. They are also mutually related to one another, the one being an individualized *non-ego*, the other being a determinate state of the *ego*.

The conditions to these acts of knowledge, as in every kind of knowledge, are to be distinguished from the act of knowledge itself. The conditions furnish the material—in one sense the objects—which the mind must know. The acting of these conditions in the production of these objects, as has been explained (§ 46), is always presupposed before the mind can know. The mind's act in know-

ing is clearly to be kept apart from the agency of the soul or intellect in preparing the object.

The conditions of the acts of sense-knowledge are the existence of the living body in connection with a sensitive or *sensational* spirit. The two furnish the material, the occasions, or the objects on which the mind exercises the intellectual act of cognition. Some of these are bodily, some are psychical. Some of these are known to physiology, others to acoustics and optics. Others are wholly unknown, as is eminently true of the powers and relations of the soul which respect the organized body. But so far as they are knowable, they are appropriately considered in explaining the power of sense-knowledge.

The condition which furnishes or constitutes the object for the *act of consciousness*, is that the soul should in fact act or suffer in a present and individual state. Unless the soul is in fact thus affected, its activity cannot be apprehended by consciousness. Consciousness takes heed of the fact, *i. e.*, of the operation, and cognizes that it is. Whence or how it is that the soul furnishes this material, or how the soul is able to act in these varied forms, it can do little to explain. These operations lie out of the range of consciousness; they are presupposed by it. On the other hand, consciousness as well as perception are largely concerned in *the use* which they make of the objective conditions or material of their knowing, and are therefore largely responsible for what the soul knows. Let the external world and the quick sensibility both conjoin to furnish ample material through eye and ear; let the active and eager soul exercise the most varied forms of act or affection; if the conscious spirit does not attend, it will fail to notice, and of course will fail to know.

§ 65. II. Next to the presentative comes *the faculty of representation*. That this is developed second in order of growth and of time to the soul's power to acquire and observe, is obvious.

The objects or products of this power are individual objects, like the objects of sense and of consciousness. They differ from them in this, that they are representative of them. Of course, they are not real, but mental objects. They are wrought or created by the mind itself, but always with respect to some real object actually experienced. This is their common characteristic, that they represent observed and experienced objects. They are representative; *i. e.*, they present a second time, and thus stand in the place of, objects previously known.

In representing these objects, the mind acts in two ways—as the memory; and as the imagination or phantasy; and hence the representative power is divided into these two. In memory it knows that the mental object represents an object previously known. In imagination it changes the representative object into another, which it has never actually experienced

According as it changes the object in more or fewer particulars, and with special applications, does the imagination receive different names.

The conditions of the representing power are, that the soul both retains and reproduces past objects for the memory to recognize and the imagination to modify. If the soul refuses to furnish these appropriate objects, neither the memory nor the imagination can know their objects. For this reason, the *power* of the soul to retain and recall is essential to the power to know these mental objects when represented. Ordinarily and properly these powers are prominently considered in the analysis of the representative faculty. That they are ideally and really distinguishable from one another is obvious. Hamilton distinguishes three separate powers, viz., the power to retain, the power to recall, and the power to represent or re-know. The last only is the purely intellectual capacity, the first two being only the capacities acting out of consciousness, which are analogous to the psycho-physiological functions that furnish sounds for the ear and sights for the eye.

Concerning the actings of this conditioning capacity of the soul we know little directly, but indirectly we know very much: that is, we know how we can affect its actings by our own conscious energies in acquiring. The relations and laws by which acquired objects can be reproduced are more obvious and better established than almost any other psychological truths. These are all comprehended under the familiar title of the *association of ideas*, and they very properly enter largely into the consideration of the representative power.

§ 66. III. The power of thought is developed last of all in the order of the soul's evolution or growth. It is also called the intelligence, and the rational faculty.

This power requires for its possible exercise some range of observation, some wealth of memory, and some creative activity of imagination. For its effective energy and its actual application it must be preceded by many separate exercises of all these functions. To the thorough and persistent use and the complete development of this power, the soul is most of all disinclined; and therefore it disuses it in many applications, especially in its higher forms, till the experience of its dignity and usefulness, furnishes motives strong enough to constrain and discipline it to habitual and facile activity.

But though this power is last and reluctantly developed, it surpasses all the other kinds of knowledge in dignity and importance. It explains facts and events by powers and laws. It enforces conclusions by premises. It accounts for inferences by data. It lifts observation up to the dignity of science, and establishes it on the firm foundation of principles. It enables us to interpret the past, and to predict the future.

The products of this power are always generalized objects. They are *universals*, as contrasted with individuals. This difference distinguishes this power of the intellect widely

from the two others. These products are known by various names, and it is chiefly by the commonly recognized differences in the names of these products, that the subordinate forms of the power itself are known and named. These products are, the *concept*, the *class*, the *judgment*, the *argument*, the *induction*, the *interpretation*, and the *system*. The general term comprehending all these products or results, and presupposing all the requisite processes or ways of knowing, is *science*, which is used subjectively for the processes, and objectively for their combined products.

In accordance with these distinguishable products, the intellect is said to perform all the acts which require the several powers or faculties of generalizing, classifying, judging, reasoning, inferring, explaining, and methodizing the individual objects given by experience. Hence the intellect is sometimes said to be endowed with as many separate faculties.

The most obvious aid or instrument provided by Nature for furthering these processes and retaining their products, is language. For this reason the existence of language is regarded as a necessary result of the power of thought, and the use of language is regarded as the indication of its presence and exercise.

The conditions
of thought.

The *conditions* of thought, as distinguished from the materials or occasions of thought which experience furnishes, are relations discerned by the power of thought itself, in a way analogous to the preparation of the occasions of sense-perception and consciousness by the subtle and recondite activity of the soul itself, and the occasions of memory and imagination through the laws of association. They are analogous so far as that the reality of these relations is an assumed condition of these peculiar operations; and when the mind comes to apprehend them, it must proceed upon the belief that they are universally present and incontestably valid. In this sense the mind itself prepares for itself these objects of its own apprehension. For the service of thought, all individual objects are still further prepared by being connected or bound together under universal and necessary relations or categories. Such are the relations of substance and attribute, cause and effect, means and end. These must be presented to the mind by the mind, in order that a single process of thought may be performed, or a single product evolved. Thus the relation of substance and attribute is assumed as real in order to the possibility and truth of the acts of generalizing and of judgment. The relation of cause and effect must be presupposed to give meaning and force to acts of reasoning and explanation. The relations of design are the prefatory conditions of acts of induction. But universal or generalized objects presuppose the existence of individual concepts and their relations, and have no meaning except as they are related to beings and phenomena as perceived and experienced. To individual beings and events, space and time relations are presupposed. Therefore, in order to the products of thought, the intuitions of *space* and

time are presupposed. In other words, the mind must assume that every individual object stands connected with other objects by all these relations before it can proceed a step in the various activities of *thinking* these objects, by conceptions, arguments, inferences, etc. These relations are said to be *a priori*, for the reason that they are presupposed in these processes. They are called *intuitions*, *primitive cognitions*, etc., etc. They are said to be universal, because applicable to every individual object in the way explained. They are necessary notions, because they are necessarily applied by the mind in all its thought-activities, and to all thought-objects.

They are, however, no more necessary to thought than they are to presentation and representation. We imply and suppose them as truly, though not as conspicuously, in perception and consciousness, in memory and imagination, as we do in classification and reasoning. We connect them more directly with the processes of intelligence, because it is not till we question or analyze these processes that we are forced to recognize their presence and assent to their validity, as directly and conspicuously assumed in them all.

Moreover, it is by means of the generalizing and the inductive processes that we discern and define these categories. It is only as we use thought-processes *critically*—i. e., as we generalize and interpret our own mental processes—that we discover these relations as everywhere and necessarily present. Though they are actually present, as the conditions and elements of all our knowing, it is only by thought that we discover and demonstrate their presence and their application, as the conditions of all knowledge. It is for this reason that the treatment of them is so directly connected with the analysis of thought, and that, when thought, in its turn, is applied to their analysis, as the explanation and vindication of human knowledge in its processes and products, then the intellect is said to reach the critical stage of its development.

In view of this distinction in the thinking power, or the two aspects in which it is to be regarded, the power itself has been treated as twofold, and been subdivided into two: the *elaborative faculty*, as performing the processes, and the *regulative*, as furnishing the rules, or more properly as prescribing the sphere and possibility of thought. These are named also the *dianoetic* and the *noetic faculty*. By some writers they are distinguished as the understanding and reason, in a usage suggested by Kant, but deviating materially from his own. Milton and others call them the discursive and intuitive Reason.

It is clear that the analysis of the thinking power involves two heads of inquiry:

(1.) What are the several processes of thought of which the intellect is capable, in the order of their development, the manner of their action, their conditions, and their products? So far as psychology prosecutes

these inquiries, it considers them subjectively as processes of the soul. When we go further, and proceed to define their products as expressed in language, or to derive rules for the knowing processes, or to test the trustworthiness of what is known, psychology passes over into the service of *logic*.

(2.) What are the ultimate relations or categories which thought, and, indeed, all knowledge, presupposes? What is the power or process by which these categories are known? What the time of their development? What the conditions of their action? What is the authority and trustworthiness of these truths? What is the relation of these intuitions to special acts of knowledge? What application can be made of them to the discovery of truth and the detection of error? Last of all, how can they be applied to vindicate man's confidence in his own knowledge, and his very power to know?

All these questions, when prosecuted with reference to the subjective power of the soul to evolve and apply these intuitions, belong legitimately and necessarily to psychology.

So far as the intuitions themselves, objectively considered, are made the subjects of analysis and discussion; so far as their relations to one another, and the structure of human knowledge, are examined; so far, in short, as they are made the subject of critical or speculative discussion, they lead us within the field of *metaphysics*, ontology, or speculative philosophy, for which, as has been already explained, psychology is the direct and necessary preparation.

In view of the importance of this critical examination of the mind's own processes, and of the trustworthiness of these products, the discussion of the so-called *intuitions*, or the concepts and relations involved in all human knowledge, falls within the province of psychology, and may properly form a distinct division in the scientific analysis of the human intellect.

We divide, therefore, our treatise into four parts, with the following titles: I. PRESENTATION; II. REPRESENTATION; III. THOUGHT; IV. INTUITION. For the explanation and justification of this division we must refer to the foregoing remarks, and the subsequent treatment of the topics themselves.

THE HUMAN INTELLECT.

PART FIRST.

PRESENTATION AND PRESENTATIVE KNOWLEDGE.

CHAPTER I.

CONSCIOUSNESS—NATURAL CONSCIOUSNESS.

We begin with presentative knowledge, and the faculties by which man is capable of acquiring it. This knowledge has been defined as concerned with objects which are directly and for the first time presented to the mind, as acquired for the mind's future recall and use, and as gained only by actual experience. It is therefore called *presentative, acquisitive, and experimental or empirical*. Of objects thus presented to the mind there are two classes: objects of matter, and objects of spirit. Corresponding to these two classes of objects, two powers or faculties are distinguished, viz., CONSCIOUSNESS and SENSE-PERCEPTION. We shall first treat of consciousness.

Consciousness defined. § 67. Consciousness is briefly defined as the power by which the soul knows its own acts and states. The soul is aware of the fleeting and transitory *acts* which it performs; as when it perceives, remembers, feels, and decides. It also knows its own *states*; as when it is conscious of a continued condition of intellectual activity, a gay or melancholy mood of feeling, or a fixed and enduring purpose. Whether the state is in such cases in fact prolonged, or only repeated by successive renewals, we need not here inquire; it is sufficient that states of the soul are distinguished from its acts by their seeming continuance.

Applied to the power and its acts. The power by which the soul is made aware of what happens to it or takes place within itself—whether it is action or affection, doing or experiencing—is called the power of consciousness, or, briefly, consciousness. We say freely and properly, man is endowed with consciousness, or consciousness is the feature by which he is distinguished from and elevated above the brutes. It might be urged that it is more exact to apply the term to the exercise of the power, rather than to the power itself. Thus we speak of an act of consciousness, through which we are distinctly aware of a mental act or state. We also talk of an appeal to consciousness, in order that we may decide whether an assertion concerning the soul is true. We intend in such language that the soul, by its consciousness of the act, can discern and decide whether the affirmation is true. And

yet it might be contended that in phrases of this kind, what is intended is the exercise or act of the power or endowment called consciousness. So easily does one of these uses pass into the other, and so readily is the name of the power applied to the exertion of the power. Of such an interchange, and consequent ambiguity, we shall find many examples as we proceed.

Consciousness used to designate knowledge of any kind. § 68. Again, the terms *conscious* and *consciousness* are often applied to any act whatever of direct cognition, whether its object be internal or external. In other words, they are used as equivalent to knowing, perceiving, etc., and to knowledge, perception, etc. Thus we say, 'I was not conscious that you were in the room;' or, 'I was not conscious that he was speaking;' as well as, 'I was not conscious of being angry.' In cases like these the terms designate an act of simple perception or knowledge. The reason why they come to do so is, that every act of knowledge, whatever be its nature or object, is attended by consciousness. The phrase, 'I was not conscious that you were in the room,' is explained as meaning, 'I was not conscious of seeing you in the room.' Especially are we said to be conscious, whenever our perception or knowledge is distinct and clear.

Whether, in the strict and limited sense of the term, we can be conscious of the act without also being aware of the object, and whether, consequently, we are properly said, in this sense, to be conscious of the object, will be discussed further on (§ 82). It is sufficient here to notice that the words are often used for distinct knowledge of any kind, especially for such a knowledge of sensible objects.

A collective term for all the intellectual states. § 69. Consciousness is also employed as a collective term for all the intellectual states. In the words of Sir William Hamilton, "it is a comprehensive term for the complement of our cognitive energies." Every such state or energy is attended by consciousness; it is an act or state of which we are conscious, or, as we sometimes say, it is a conscious act or state. The sum-total of all such acts is therefore expressively described as the consciousness of an individual. It is equally true that we are conscious of our states of feeling, and all these may be designated by the same general and comprehensive term, though with somewhat less propriety. So, also, the various modes of the soul's activity, whether we speak of what is actual or possible to an individual or a class of men, or to the whole human race, are comprehended under the term; as when we speak of the range of human consciousness as equivalent to the states or modes of actual or possible human experience.

Some writers have borrowed from the German the phrases, 'the Christian consciousness,' and the like, making consciousness, for the reason already given, to represent those beliefs and feelings of which the Christian, or any other type of man, is conscious. All the acts and states which are comprehended under this abstract designation have this common characteristic, that we are conscious of them all. We therefore designate them all by this common feature.

Metaphorical definitions of consciousness. § 70. Consciousness is often figuratively described as the 'witness' of the states of the soul, as though it were an observer separate from the soul itself, inspecting and behold

ing its processes. It is called the 'inner light,' 'an inner illumination,' as though a sudden flash or steady radiance could be thrown within the spirit, revealing objects that would otherwise be indistinct, or causing those to appear which would otherwise not be seen at all. Appellations like these are so obviously figurative, that it is surprising that any philosopher should use them for scientific purposes, or should reason upon, or use them with scientific rigor. However they are intended, they are liable to this objection, that they often mislead the student by furnishing him a sensuous picture, a pleasing fancy, or an attractive image, when he needs an exact conception or a discriminated definition (cf. § 25).

Thus Cousin says (as translated by Henry): "Consciousness is a witness which gives us information of every thing which takes place in the interior of our own minds. It is not the principle of any of our faculties, but is a light to them all."—Cousin's *Psychology*, chap. x.

Dr. Hickok, also: "If, instead of attempting to conceive consciousness as a distinct mental faculty, . . . we will consider it under the analogy of an inner illumination," &c. "The conception is not of a faculty, but of a light; not of an action, but of an illumination; not of a maker of phenomena, but of a revealer of them as already made by the appropriate intellectual operation."—*Empirical Psychology*, Introduction, chap. iii. 2.

§ 71. The terms *conscious* and *consciousness* explain their own meaning, and confirm the truth of the assumption and belief that the fact implied by the language is to be received. They describe a *knowing with*, or an attendant knowledge, and they imply that the states of the human soul may be known by the soul to which they pertain.

The power of the soul thus to know itself is often called *the internal*, or *the inner sense*. This term is suggested by analogy. As the soul, by the external sense or senses, apprehends the properties and qualities of matter, so it is said to know its own states and powers by another, viz., an inner sense.

This analogy has been pushed by many to an extreme. It has been inferred, because, as the conditions of the apprehension of external objects and qualities, special sensations are required, it therefore follows that there must be an analogous something in the spirit, preceding the apprehension of internal operations; that, because the power is called a sense, it must experience *quasi-sensations*. Cf. Fries, *Neue Kritik der Vernunft*, vol. I. §§ 21–28.

§ 72. Consciousness is, for the same reason, also called by many philosophers, as Leibnitz, *ad-* or *ap-perception*, by which term the same fact is recognized that consciousness implies, viz., a perception of the mind's own states, in addition to the perception of the objects of those states.

Apperception is not, however, limited to this application, but is used for any additional or added perception; as, for example, of the real object in addition to the image which represents the object. Apperception in this sense is very near to the reflective, or secondary consciousness, to which we shall advert hereafter.

Proper meaning
of consciousness.

Apperception;
why so called.

"Thus it is well to make a distinction between perception, which is the inner state of the monad, representing external things, and apperception, which is consciousness, or the reflexive knowledge of this interior state, which is not given to all souls, nor always to the same soul." Leibnitz. *Of Nature and Grace*, § 4, cf. *Mémoire sur l'apperception de la propre existence*.

It is worth while to notice that among the philosophers of the Leibnizian school the word *apperception* is variously defined. Thus Christian Wolf says: "Menti tribuitur *apperceptio* quatenus perceptionis sua sibi conscia est.

"*Apperceptionis nomine utitur Leibnitzius: coincidit autem cum conscientia, quem terminum in presenti negotio Cartesius adhibet.*"—*Emp. Psych.*, V. i. sec. i. cap. ii. § 25.

But D. M. G. Hanechiüs, in his *Leibnitzii Princ. Phil.*, says, after defining apperception, Sec. cxi.: "*Apperceptio includit claritatem representationis. Coroll. II. Omnis perceptio distincta, est apperceptio.*"

It is interesting to observe how that, in these two distinct significations of apperception, we have the precise counterpart of the two senses of consciousness as knowledge and clear knowledge. The solution is well expressed by the remark of Wolf: "*Omnis cogitatio et perceptionem et apperceptionem involvit.*"

The term *Bewusstseyn*, and its cognates in the Teutonic languages, recognizes rather the distinct than the accompanying knowledge which consciousness makes prominent. It describes a *be-*, rather than a *con-*knowing; i. e., the clear and completed knowledge which the mind usually attains by a second and more attentive look. Hence it is with eminent propriety applied to that knowledge which the soul has of its inner states, as this, to be of any service, must be earnest and attentive. The word in German, however, is not so closely limited to this internal knowledge, as is consciousness, in English. It is supplemented by self-consciousness—*Selbst-bewusstseyn*. Hence sometimes, when we should use consciousness only, the Germans would say self-consciousness. Their more usual technical appellation for the power is the inner or internal sense.

Not a little confusion of thought has resulted from the failure of some, not to say of most translators, to notice that the proper meaning of *Bewusstseyn*, especially in compounds and with prefixes, is knowledge rather than consciousness; e. g., *Gottesbewusstseyn* is not so well translated by the 'consciousness of God,' as by the 'intuition of God,' or 'the direct and necessary knowledge of God.' Of Biunde, *Versuch. d. emp. Psych.*, B. i. § 49.

§ 73. *Reflection* is the appellation used by Locke for this power; or, more exactly, it is under this appellation that he discusses its nature and authority. Hence, among many English writers reflection is freely used as the exact equivalent of consciousness. It is the great and distinctive merit of Locke to have called attention to it as a separate source of knowledge, and to have claimed for the knowledge which it furnishes equal authority and certainty with that which is received through the senses. That Locke did not originate the term, nor the conception which the term denotes, is established decisively by Hamilton (*Met.*, Lec. 13). Locke's language is worth quoting for the clearness with which he expresses his doctrine, as well as for the importance of the passage in relation to the history of psychological and philosophical opinions:

"The other fountain from which experience furnisheth the understanding with ideas, is the perception of the operations of our own minds within us, as it is employed about the ideas which it has got; which operations, when the soul comes to reflect on and consider, do furnish the understanding with another set of ideas, which could not be had from things without; and such are *perception, thinking, doubting, believing, reasoning, knowing, willing*, and all the different actings of our own minds; which we, being conscious of, and observing in ourselves, do from these receive into our understandings as distinct ideas as we do from bodies affecting

Consciousness
and reflection as
defined and used
by Locke.

our senses. This source of ideas every man has wholly in himself; and though it be not sense, as having nothing to do with external objects, yet it is very like it, and might properly enough be called internal sense. But as I call the other, sensation, so I call this, reflection, the ideas it affords being such only as the mind gets by reflecting on its own operations within itself."—*Essay*, Book ii. chap. i. § 4.

The passage quoted, has been a fruitful text for controversy in respect to many questions. The only questions, however, with which we are at present concerned, are (1.) whether Locke distinguishes consciousness from reflection? and (2.) if so, does he define the relation of one to the other? To the first, we answer: that Locke uses the terms *consciousness*, and *reflection*, in separate passages, no one can deny who reads the following passages—*Essay*, B. ii. c. 27, § 9; c. i. § 19; c. i. § 24; c. 10, § 5; c. i. § 4. He says distinctly, "Consciousness is the perception of what passes in a man's own mind." He insists most earnestly that the soul cannot be active without being conscious of its activity. "No man can be wholly ignorant of what he does when he thinks." Whenever he has occasion to speak of the power which gives us ideas of our operations, he invariably uses the term *reflection*. The reason is obvious from his own words as quoted above—"which operations, when the soul comes to *reflect* on and *consider*, do furnish the understanding with another set of ideas." In other words, though we cannot but be conscious of every act of thought, or, as elsewhere explained, of every state of the soul, yet it is only when we *reflect* or *consider* these that we gain ideas of them. To the second question we answer: that Locke nowhere in form defines the relation of consciousness to reflection. It never seems to have occurred to him that they are related, or that he ought to explain what their relations are. The questions which, since his time, have assumed so great interest and importance, did not present themselves to his mind. From the use which he makes of these terms, however, we are fully authorized to derive the following as a just statement of the opinions which he would have expressed had his attention been called to the relation of consciousness to reflection: In order to gain ideas or permanent knowledge of the mind, we must use a certain power with reflection and consideration. But the power itself is not created or first exercised by or in such acts or efforts. These are but exercises of this power in a given way and energy. The power itself is the capacity of the mind to know its acts or states. This power is consciousness, which Locke himself has defined to be "the perception of what passes in a man's own mind," and without which man never thinks at all. When this power is used in a peculiar way, and with energy or concentration enough to secure a certain effect, it becomes *reflection*. *Reflection* is therefore *consciousness* intensified by attention. Inasmuch, however, as the power is rarely referred to except as giving the results of actual knowledge, *reflection* is the word by which it is usually known.

Two forms of its activity.

§ 74. Consciousness is exercised in two forms or species of activity, viz., the natural or spontaneous, and the artificial or reflective. They are also called by some writers *the primary* and *the secondary consciousness*. The one form is possessed by all men; the other is attained by few. The first is a gift of Nature and product of spontaneous growth; the second is an accomplishment of art and the reward of special discipline. The natural precedes the reflective in the order of time and of actual development. But it does not differ from it in kind, only in an accidental element, which brings its results within our reach and retains them for our service. This is the general conception which we form of both, as preliminary to the special consideration of each.

Consciousness, like every other kind of knowledge, can be exercised with varying degrees of energy. In other words, it can be accompanied with more or less attention. The degrees of attention with which it is exercised by different persons at different periods in different conditions of life, and under the aids and excitements of education and culture, are exceedingly numerous, and distinguished by shades of difference that readily run into one another. They are measured by a scale of more extensive range than can be applied to the varying energies of any other human endowment. Men differ more widely in respect to the energy and effect with which they use this power, than in respect to any other.

The capacity to attend to the psychical states in the lowest appreciable degree—i. e., with that energy which leaves any permanent product or result for the memory or imagination—is

matured by the slow education of infancy and childhood (§ 86). During this period, even under the most favorable circumstances, the growth and development of consciousness is steady, but slow. Under the influence of moral and religious stimulus it is oftentimes brought to striking maturity in persons who, in other respects, have little culture. Not unfrequently its development is carried to a morbid excess.

Where consciousness is energized by attention, and applied to psychical phenomena for scientific purposes in the interest of psychological science, it is called the secondary, the artificial, the philosophical or reflective consciousness, or simply, reflection. As such, it is distinguished from and contrasted with the primary, the natural, the common, the unreflecting consciousness, or simply, consciousness. The division indicated by these contrasted terms is convenient and important. It should always be remembered, however, that the two so-called species of consciousness do not differ from one another in kind, but in degree, and that there is no well-defined and sharp line of distinction that divides off the one from the other. Nor should it be forgotten that the so-called natural consciousness, or consciousness as possessed and used by adults of average culture in an intelligent community, is the result of growth and the product of culture (§ 86). The power and habit of attentively apprehending one's own psychical states exists in such persons in various degrees of energy and perfection. The several stages of the growth of the natural consciousness are sometimes indicated by terms ranging from the lower toward the higher points in the scale, as, self-feeling, consciousness, consciousness of the *ego*, self-consciousness. These appellations are artificial and technical, which have scarcely been received into current use, or taken a precise import.

In treating of consciousness, we begin with what we called the natural or primary consciousness. We shall first treat of the elements which are essential to this form of knowledge, with whatever degree of energy it may be exerted, and afterward treat of its growth and development.

Natural consciousness defined as an act. Necessary to all acts.

§ 75. We begin with natural, or primary consciousness. Natural consciousness is the power which the mind naturally and necessarily possesses of knowing its own acts and states. It may be further described by considering it in its operations and its objects, or as consciousness *the act*, and consciousness *the object*.

We begin with *consciousness the act*. As an act, it is a necessary and essential constituent of many active conditions of the soul. The soul cannot know, without knowing that it knows. It cannot feel, without knowing that it feels; nor can it desire, will, and act, without knowing that it desires, wills, and acts.

It is held by many psychologists that there are states of the soul of which we are not conscious. Others hold that we are conscious of all its activities. We do not discuss the question here, but reserve it for future consideration (§ 87). For our present purpose, it is enough to assert, as all will agree, that there are many acts of which we are naturally and necessarily conscious.

An act of knowledge involving relations and product.

Consciousness is an act of knowledge, and is therefore an act purely and simply intellectual—an exercise of the intellect only. The states observed may be psychical, *i. e.*, indifferently states of intellect, sensibility, or will—but the act by which they are known is intellectual only. It is an act of direct or intuitive knowledge. To attain it, neither memory nor reasoning are required, nor any indirect process or succession of acts, but the soul immediately knows

its present condition or act. It confronts it face to face. It knows it as now existing. It is eminently presentative knowledge.

Consciousness, as an act of knowledge, is matured into, or results in a peculiar product. When it is complete, it furnishes for the mind's recall an idea of the object known. This is a purely intellectual result. What the mind is conscious of may be a state of knowledge, feeling, or choice, but the mind's consciousness of feeling or choice, as a product or result which it retains and recalls, is not feeling or choice, but the idea or image of either. The feeling and choice which we recall is not a feeling or choice, but our idea or image of a feeling or choice, and this is purely intellectual. This is very important to be considered for a correct theory of representation. As an act of knowledge, it involves the discernment of relations (§ 49). We know the state to be our own; i. e., we discern its relation to ourselves. We know that the present is not the past state of the soul; i. e., we know the two under the relations of contrast and of time. Again, the knowing agent distinguishes itself as the conscious observer from itself and its own states as the object observed. While it knows the states which it observes, to be its own, it discriminates the object observed from itself, the observer, and from its own act of observation. Thus it fulfils the conditions which have been laid down as common to every act of knowledge, that it is at once an act of analytic separation and synthetic union. The object thus discriminated from and by the observer becomes, when it is discriminated with sufficient attention, a separate product for the mind's retention and recall, or furnishes material for the representative power under its several forms of phantasy, memory, and imagination.

A peculiar act.
In its conditions.

The act of consciousness is a peculiar intellectual act—an act that is preëminently *sui generis*. Especially is it peculiar in the conditions of its exercise. To most of the other acts of knowledge it is required that their objects should exist before they are known. But in this peculiar process the object and act are blended in one.

Thus, the landscape on which I gaze is a permanent object, to which I can bring and from which I can withdraw my mind. The thought or feeling which I remember must have been experienced in order that it may be known a second time. It is rashly concluded by many that this is a necessary and universal condition of all knowledge. Hence it is argued, that the act of consciousness is impossible because it is inconceivable and irrational. It violates, as is objected, the first and essential requirement, that something should *have* existed, in order to be known. 'How can I know that I know,' it is urged, 'unless I have first known, in order to furnish an object for me to know?' Or it is concluded that consciousness is, at best, but a kind of memory, an act that immediately follows the act or state of which we are said to be conscious. "No one," says Herbert Spencer, "is conscious of what he is, but of what he was a moment before. That which thinks, can never be the object of direct contemplation; seeing that, to be this, it must become that which is thought of, not that which thinks. It is impossible to be at the same time that which regards and that which is regarded." *Principles of Psychology*, Part I. chap. i. p. 40. Cf. F. Bowen, *Essays*, pp. 181, 2. Merian, *sur l'Appréhension*, etc. The force of this objection is in the pure assumption, that every thing which is

known must have already existed. But this assumption is unauthorized. It is derived from a supposed analogy between this and other acts of knowledge. It by no means follows, because the landscape must have existed before we see it, or the mental state must have occurred before we remember it, that a perception or feeling must be past before we can be conscious of it. Whatever we experience of a mode of knowing, must be real, whether it is like or unlike any other, provided only that we are sure that we have to do with facts, not with fancies. Besides, how can one remember that which he did not know at the time when it occurred? How can one recall the state in which he was a moment before, and know that he was in that state, if he did not know he was in that state at the precise and passing instant? Those that resolve acts of consciousness into acts of memory, make memory itself impossible, however closely it is said to follow the act which is remembered. We cannot recall the act itself, nor that it was our own act, unless we knew both, when the act occurred.

§ 76. It is also objected, that the very language by which we seek to describe an act of consciousness, proves the act itself to be impossible. The act of knowing, it is said, is expressed by one phrase, and the object known by another. They cannot, therefore, coincide in a single mental state or experience, as is demonstrated by the very terms in which we seek to describe the impossible phenomenon. The phenomenon is, therefore, refuted by the logical incompatibility of the terms which describe it. To this it is sufficient to reply, that when we say we know that we know, we neither assert nor imply that the act of knowing is separable in time from the object known. We employ two phrases, indeed, as we often employ separate words to designate what we distinguish in thought, which is yet undistinguished in time.

It is a most important maxim in philosophy, without which we may almost say it is impossible to prosecute philosophical analysis of any kind with effect and success, that there are very many objects which we can distinguish in thought and describe by separate words and phrases, which cannot be separated in fact. Thus we distinguish the length from the breadth of a superficies; but both belong to it, and if one is absent, neither the other, nor the superficies itself, can have any being, nor can either be logically supposable. We also distinguish the color from the extension, and both from the hardness of a material body; but neither can exist, nor can either be apprehended apart. The truth and importance of this maxim we are not yet prepared to discuss. It can only be fully appreciated and justified after a profound and subtle inquiry into the nature of all analysis. But the examples cited permit a sufficient answer to the objection, that language and thought prove the act of consciousness to be impossible and self-contradictory.

Here, too, we may apply the principle already recognized, that the language by which we describe mental acts and states was originally applied to the properties and energies of material objects. When, therefore, we would express or describe the peculiar act by which the soul knows itself, we must use phrases, and, it may be, figures of speech, which were first applied to matter and sensible things. The associations and expectations which are proper to the one species of knowledge, should never be allowed to disturb our faith in the other. Least of all should an objection derived from the mere forms and figures of language occasion the slightest difficulty in receiving a well-accredited and an experienced fact.

Consciousness
the object.

§ 77. From the consideration of *consciousness the act*, we pass to *consciousness the object*. The object of consciousness has already been defined to be an act or state of the soul

more exactly, the soul acting and suffering in an individual state. That such an object should be peculiar and unlike any other, we are prepared to believe, by what we have already noticed under consciousness as an act. Other peculiarities will reveal themselves to a closer inspection.

We observe, in general, that the phenomena of the soul are unlike the phenomena of matter in this, that they are given to observation as essentially complex even in their greatest simplicity. We cite some examples of sense-phenomena. We observe the flying of an arrow, the shooting of a star, the melting of gold, the singing of a bird, the odor of a flower. What we know in these cases by direct intuition, is an event or phenomenon which afterward, by a reflective process, we refer to some substance or subject, and in which we detect certain necessary relations to space. The flying, the shooting, the melting, the singing, we refer to some being to which they belong. That which is necessarily discerned by the senses, is the phenomenon itself as a simple event, on which the mind may rest without contemplating it under any other relation. But phenomena of the soul can never be known by consciousness as simple. Every state or condition of the spirit is in its real nature, and must be actually known by the soul, to be complex, even in its extremest simplicity. This object is *threefold* in its elements, every one of which must be recognized by the conscious spirit. The elements are, the identical *ego*, either agent or patient according as the case may be; the object with respect to which it acts or suffers; and the present state or action in which it exists or acts. Every psychical state of which we are conscious implies an acting or existing *ego*, to which the state pertains. A condition of the soul without an individual person acting or feeling, is impossible as a conception, and is never experienced as a fact. Again, this *ego* is known to be in a definite form or condition of action or suffering. The states are transient, the agent remains. The states are as fleeting and as transitory as the flying moments; indeed, they come and go more swiftly than any instants which we can count; the individual self remains unchanged, referring all these changes to itself. Again, the *ego*, in its acting and suffering, is concerned with some object. It must have some object to be employed upon, either material or mental. One state is as often distinguished from another by its object, as by any thing beside. These are the elements which make up that complex whole which we call the object of consciousness.

Relation of consciousness to each of these elements.

§ 78. It is a natural question, What is the relation of consciousness to each of these essential constituents, as combined together in one general view, or as each calls forth special and separate attention? To this question we give this general preliminary answer: The soul, in consciousness, is directly cognizant of all these elements, as entering into every one of its states. It knows them as distinguishable from one another, and yet as, in their union, consti-

tuting a single whole. The whole is constituted of all these elements; each as related to each and every other make up a state of the soul. To any such state one element is as necessary as another, and one relation is as necessary as another to the conception and as essential to the fact. Of these elements and these relations the soul is equally cognizant.

Here we observe that, in an act of direct or intuitive knowledge like consciousness, it is as essential that the connecting bonds should be apprehended, as the parts which they bind or connect. In abstract or logical knowledge, the parts are considered separately, and to each we assign a separate word or phrase; but in real knowledge the parts are viewed together. The verbal expression of a mental state is not a single word, as *I, perceive [or] love, this apple*, each apprehended apart, and then somehow aggregated into a phrase or proposition; but it is a finished proposition, in all its parts and relations, as, *I perceive [or love] this apple*. In other words, we can analyze or separate only what the concrete or real presents in union. If the parts and connecting relations are not discerned together by an intuitive act, they can neither be separated nor united by any other act or process. The objects known by consciousness are intuitively known. All the materials which mediate or abstract knowledge evolves from these objects, the objects must be known already to *involve*.

Herbart, and the psychologists of his school, deserve especial notice in this connection. This philosopher contends that it is by no means essential to every mental act or state that it should be distinguished as agent, act, and object. On the other hand, he insists that the reference of an act or state to the *ego* as the subject of it can only occur at a later and more advanced period of the mind's growth and development. It is the doctrine of his school that the knowledge of such an *ego* or subject is itself a product which is slowly developed and matured out of the materials that are furnished in previous mental experiences and states. Last of all, and as consistent with and fundamental to their other positions, they teach that every elementary mental state is simple in its nature, and is the joint result of the mind itself as a simple substance and the occasion which calls it forth.

It might seem at the first view that these opinions cannot justly be ascribed to the influence of material analogies, for, against these, the Herbartian school endeavors to secure itself by a principled opposition. They seem to rest rather on Herbart's peculiar logical or metaphysical system, which resolves all beings, both spiritual and corporeal, into ultimate elements or monads, the various relations of which to one another are to be so determined as to be freed from all contradiction. Conjoined with this are certain assumptions in respect to the conditions and laws of mental phenomena, both in original apprehension and reproduction, which exclude the possibility of the complex character which we assume to be the necessary condition of every mental state.

But while it is true that Herbart is professedly and distinctly an *anti-materialist*, it would not be difficult to show that both his metaphysical system and his psychological analyses were formed under a strong desire to apply to mental phenomena the principles and laws on which the physical and mathematical sciences are founded. Indeed, it might be shown that the Herbartian psychology furnishes the most striking example, because it is at once the most consistent and complete of all similar systems, of the influence of assumptions derived from physical philosophy. While it aims to recognise and do justice to the facts and phenomena that are peculiar to the soul—while it distinctly recognises spiritual phenomena as opposed to the material and physiological conditions on which they depend—it does, by the principles and laws which it applies to their explanation, in fact exclude and rule out the very features which most strikingly distinguish the phenomena of spirit from the phenomena of matter. Those powers and operations of the soul, on the other hand, which are most nearly allied to those of matter, are accepted as explaining all the rest; which are resolved into and reduced back to these as furnishing both their constituent elements and their law-giving formulae.

It is here in place to notice Herbart's doctrine concerning the simplicity of all original mental states, and the subsequent evolution, from such states, of the *ego* as their subject. We argue that this doctrine cannot be true, on the ground that, if it were, the act of memory would be impossible. An act of remembrance implies that a present state is connected with a past by the distinct knowledge that the same *ego* was the subject of both, and that this *ego* has continued to exist and be the subject of other states during the interval of time which has separated the two. By the theory of Herbart, memory would be impossible until the mind had attained to the knowledge of the self, as distinguished from, and yet as the subject of, its various separate states; and also had connected these states together, as pertaining to an identical subject. On the other hand, the knowledge of the *ego* must itself depend on memory, and could not be developed without it; for how could it be that the various states could be presented in such a way as to evolve the self

and not self, and even the body and the not body, the eye and not eye, unless the states were in some way connected together by some thread or bond of continuity, and thus so blended or complicated together as to form wholes and parts! Herbart would reply, that the soul is a simple entity or substance, and that it is its simplicity which makes it possible that various objects or stimuli should be united in a single state. But how does the mind know itself to be simple or in a state, unless it can distinguish itself from its states! or how can it know its states, each as one, and all as following each other, unless it knows that its states belong to itself—i. e., unless it distinguish its states from itself. In the order that marks either of these distinctions, it must first know that these states are true of itself—i. e., it must go so far as to distinguish itself at least from its own acts. This must be done by an original apprehension, or it cannot be done at all. No combination of elements not already present, no repetition or addition of such elements, can account for or explain the presence of what is acknowledged in the later stage of mental development. They, must, therefore, have certainly been originally present, and may be set down as the essential constituents of every mental state.

These elements
not always view-
ed with equal
attention.

§ 79. But though these elements are always recognized in every object of which we are conscious—i. e., in every conscious mental state—they are not regarded with equal attention. At one time one is foremost in our notice, and seems to draw to itself the entire energy of the conscious act; at another time another element is more distinctly apprehended. According as one or other of these elements receives the chief attention and is most absorbing, so is each state of consciousness definitely and peculiarly marked. It is worth while to notice how more or less of the recognized prominence of any one of these elements gives a peculiar character to the psychical state as observing and as observed. We will consider the influence of each of these elements singly and apart.

The activity may
be chiefly no-
ticed.

§ 80. First, let the soul's own activity be the special object of its own conscious observation. We begin with this, because all concede that this must be apprehended. Indeed, many contend that this is the sole object of the conscious act.

The soul's own acts and states are continually changing, and if it is aware of any thing, it is aware of each present state or condition in which it finds itself. With this material or object-matter it is preëminently occupied. These it observes and remembers, and, if need be, classifies and records. Whether it knows itself or not, it must know its own acting and suffering. The states come and go, they rise and fall, they are varying and restless as the waves of the ocean, each pushing forward the one that went before. The *ego*, if it is known at all, is known as persistent, intractable, identical. Moreover, these states are the products of its own energy, or the suffering or joyful experiences of its own sensibility. What can it be conscious of, if it knows not these? Whether they are called states of knowledge, feeling, or will, each separate state is distinguished by a separate apprehension. For these reasons it will not be doubted that the operation or state of the soul is the appropriate object of consciousness—is the central element, the element *par excellence*, if the object is believed to be complex; the sole object, if the object is conceded to be simple.

The fact that in consciousness we are observant of the soul's subjective state, was first distinctly noticed and forcibly stated by Locke. Descartes, before him, had recognized and emphasized the truth that through consciousness we are as distinctly cognizant of spiritual phenomena as we are of physical facts by sense. But it was Locke who asserted and emphasized the circumstance that what the mind apprehend

by this power, i. e., reflection, is the soul's operations, and that it is of these operations, and only of these, that it gains the determinate ideas which he calls the ideas of reflection. To these operations Locke gave exclusive attention, including under them the feelings as well as the acts, (*Essay* II. § 4,) overlooking their relations to the agent and the object. Since the time of Locke, it has passed into a positive dogma, that the soul in consciousness cognizes the operation only, and nothing besides. Thus Hume says: "For my part, when I enter most intimately into what I call *myself*, I always stumble on some particular perception or other, of heat or cold, light or shade, love or hatred, pain or pleasure. I never can catch myself at any time without a perception, and never can observe anything but the perception."—*Human Nature*, Part IV. sec. 2. "If any one, upon serious and unprejudiced reflection, thinks he has a different notion of himself, I must confess I can no longer reason with him. . . . He may, perhaps, perceive something simple and continued, which he calls *himself*, though I am certain there is no such principle in me." Dr. Thomas Reid says: "I am conscious of perception, but not of the object I perceive; I am conscious of memory, but not of the object remember." But he guards himself against the conclusion drawn by Hume from their common assumption, or insisting that, though consciousness does not give us the intuition of self, yet we have a firm belief of the reality of the self, through a native and necessary suggestion, for "our sensations and thoughts do also suggest the notion of a mind, and the belief of its existence and of its relation to our thoughts."—*Inquiry*, chap. ii. § 7. Dugald Stewart says: "We are conscious of sensation, thought, desire, volition, but we are not conscious of the existence of the mind itself. This is made known to us by a suggestion of the understanding consequent on the sensation, but so intimately connected with it that it is not surprising that our belief of both should be generally referred to the same origin."—*Phil. Essays*, p. i. e. i. Dr. Thomas Brown says of a special sensation, as of fragrance: "There will be, in the first momentary state, no separation of self and the sensation, no little proposition formed in the mind—I feel, or, I am conscious of a feeling, but the feeling and the sentient I, will for the moment, be the same. If the remembrance of the former feeling arise, and the two different feelings be considered by the mind at once, it will now, by that irresistible law of our nature which impresses us with the conviction of our identity, conceive the two sensations which it recognises as different in themselves, to have belonged to the same human being—that being to which, when it has the use of language, it gives the name of self, and in relation to which it speaks as often as it uses the pronoun I."—*Lectures* xi. Hamilton says: "On the other hand, as there exists no intuitive or immediate knowledge of self as the absolute subject of thought, feeling and desire, but, on the contrary, there is only possible a deduced, relative and secondary knowledge of self as the permanent basis of these transient modifications of which we are directly conscious, it follows," &c.—*Notes on Reid*, (*H.*), p. 29, b. This doctrine is entirely consistent with Hamilton's doctrine of the relativity of our knowledge, however inconsistent it may be with other separate propositions or reasonings of Hamilton's.—*Of Met. Lec. 19, on Mental Unity*. Mansel dissents from Hamilton on this point. See *Proleg. Log.* c. v. "I am immediately conscious of myself, seeing and hearing, willing and thinking." James Mill agrees with Brown etc.: "To say that I am conscious of a feeling, is merely to say that I feel it. To have a feeling is to be conscious, and to be conscious is to have a feeling. To be conscious of the prick of a pin, is merely to have the sensation."—*Analysis of the Human Mind*, Chap. v. But he corrects himself in another passage, as follows: "The consciousness of the present moment is not absolutely simple, for whether I have a sensation or an idea, the idea of what I call myself is always inseparably combined with it. The consciousness, then, of the second of the two moments in the case supposed, [the case of remembering a preceding state,] is the sensation combined with the idea of myself, which compound I call 'myself sentient,'" &c.—*Id.* Chap. x. John Stuart Mill says, in the same strain: "My mind is but a series of feelings," and defines it as, "a thread of consciousness," "a series of feelings with a background of possibilities of feeling."—*Exam. of the Phil. of Hamilton*, c. 12; cf. *System of Logic*, B. I. C. iii. § 8.

The psychologists of the school of Condillac have followed in the same direction with the English successors of Locke, and have denied altogether that the soul is directly conscious of any thing besides its operations. Those taught in the Scottish school, like Royer Collard, have adopted the views expressed by Reid and Stewart, with this difference, that what these writers ascribe to suggestion, or its equivalent, Collard refers to natural induction. The more modern school of Cousin and his eclectic disciples, follow Maine de Biran in asserting that the soul has a direct consciousness of the ego, as well as of the ego in some form of activity or suffering. This is one of their cardinal and distinctive tenets. De Biran derived his views from the suggestions of Leibnitz, and this circumstance connects the schools of France with those of Germany.

The German psychologists have, with the exceptions to be stated hereafter, agreed with Leibnitz in asserting that the soul knows not only its states, but itself as their subject in feeling and their agent in producing them. In the unity of self-consciousness the soul knows itself as well as its acts and states. Without this reference of the states of the soul to the ego which is the subject of them, consciousness is inconceivable and impossible. Kant asserts this as a fact of our experience and a necessity of our nature as earnestly as any one, even though he questions the validity of the knowledge which is thus made necessary to the mind. He is entirely outspoken and confident when he testifies concerning the facts which we experience, even though he finds metaphysical reasons for distrusting what we are certain that we distinguish and know. It is true that this self of the "inner state," which, according to Kant, we are conscious, is only known as a phenomenon, and cannot (as indeed nothing can, according to his system) be known as it is in itself."

Dencke and Herbert are the most noticeable exceptions to this general characteristic of the German

psychologists, and of these, Herbert has been most conspicuous in sturdily and even scornfully rejecting the doctrines on this subject that are usually received. Indeed, his views in respect to consciousness itself, would change completely our fundamental notions of the science of the soul, and require that in its methods of inquiry and the sources of its knowledge it should be entirely reconstructed. Herbert rejects entirely the opinion that the soul can be at the same time the observing agent and the observed object. He insists that this is logically contradictory, and metaphysically impossible. He therefore denies that the soul knows its own states in any proper sense of being directly aware of them when they occur. What we call consciousness, is but reflective memory. Much more, therefore, must Herbert reject, as he does most contemptuously, the doctrine that the soul refers these states to the *ego* or the personal and identical self. He insists that the belief of the *ego*, and even the very conception of the *ego* as the subject of the psychical states, is an after-thought, the mature product of comparison and reflection, gained not by suggestion, nor by deduction, nor by a necessary and original law, but reached by comparison and analogy.

§ 81. Second. Of the *ego* itself we are also directly conscious. Not only are we conscious of the varying states and conditions, but we know them to be *our own states*; i. e., each individual observer knows his changing individual states to belong to his individual self, or to himself, the individual. The states we know as varying and transitory. The self we know as unchanged and permanent.

It is of the very nature and essence of a psychical state to be the act or experience of an individual *ego*. We are not first conscious of the state or operation, and then forced to look around for a something to which it is to be referred, or to which it may belong; but what we know, and as we know it, is the state of an individual person. A mental state which is not produced or felt by an individual self, is as inconceivable as a triangle without three angles, or a square without four sides. This relation of the act or state to the self is not inferred, but is directly known.

If it were not directly known, it could not be indirectly believed or inferred. What we infer and conclude is, in some cases, the product, or the educt, or result, of the mind's activity in comparing and inferring; but we cannot conceive how that the soul should conclude or infer operations and states to belong to itself the observer, if it did not know this by direct inspection.

The fact of memory proves it beyond all dispute. In every act of memory we know or believe that the object now recalled was formerly before the mind; in other words, I, the person remembering, did previously know or experience that which I now recall. But how could this be possible, if the first act or state was not known, when it occurred, to belong to the same *ego* which now recalls it and must have existed and have known itself to exist during the intervening time? This same *ego* must have known or been conscious that the state was its own when it occurred; otherwise it could never have remembered this state. But again, many acts of memory are required in order to gather the past operations or states together, before they are inferred to belong to one substance or substratum. In order to infer, we must have remembered; and in order to remember, or rather in the act of remembering, we must have believed the very thing which we are said to

Consciousness of the *ego*.

Involved in the nature of a psychical state.

If not known, could not be inferred.

Proved by every act of memory.

infer. Nor is it true that, on occasion of many of these operations, the reality of the subject of these operations is *suggested* or *provided* under a necessary law of the intelligence or reason; for how could these operations be recalled without memory? and memory, as we have seen, implies the constant reassertion of the very knowledge which is in question.

It will be found, moreover, that all those writers who deny or doubt this, do yet incidentally betray their faith in the reality which they by words or reasonings oppose. Dr. Brown, who is so earnest in opposing it, cannot thread together the several experiences of the soul's life, without resorting to "the irresistible law of our nature which impresses us with the conviction of our identity," and James Mill himself is forced in one sentence to confess what he stoutly denied in another; "for whether I have a sensation or an idea, the idea of what I call myself, is always inseparably combined with it." These are more or less distinct expressions for the direct knowledge of the *ego* which enters as an essential constituent into every conscious state of the soul.

Admitted by those who deny it.

When we assert that the soul is conscious of itself, the actor, as truly as of its states or acts, we by no means assert that it makes the *ego* an object of attention or reflective thought, or that it gains a scientific knowledge of its states or of its powers. Both these kinds of knowledge are reserved for a higher development and exercise of consciousness itself, as will be seen in its place.

It has already been observed, that the knowledge of the self, or the *ego*, which is essentially involved in natural consciousness, is also susceptible of various degrees, which range from the feeblest and most rudimentary cognition which the soul can possibly have of itself, up to the most intense self-consciousness which can be reached by the most attentive introspection. The consciousness of the self, or *ego*, as it admits of various gradations, is also capable of development and growth, not in the sense that the *ego*, or self, is the product of a certain stage of the progress of intelligence so as not to have existed before, but that it is revealed to the mind more distinctly and in more numerous relations, as the requisite attention is applied.

Least of all do we assert that the soul is directly conscious of that, in its being or substance, which fits it to be the common ground or substratum of its physical as well as its psychical phenomena, or which explains the relations of the two.

Consciousness knows nothing of the hidden relations of the soul to the body. Facts and relations of this sort are not given to consciousness at all, nor are they open to the soul's direct intuition. But whatever theory may be framed in respect to the substance of the soul, whether it be believed to be material or spiritual, the fact remains unquestioned that it knows its states to be its own, and in this knowledge knows itself as the subject of them. Whatever relation this known *ego* has to this imagined substratum or essence, the fact remains unquestioned that the *ego*, as a being, is directly known to and by itself as a knowing agent. So far, and so far only, does consciousness testify.

§ 82. Third, we inquire still further, What are the relations of consciousness to the *objects* of the psychical acts and states? Is the soul conscious of the objects as truly as it is of the states themselves? When I gaze upon a landscape, and am delighted, am I conscious of the landscape which I see, as truly as I am conscious of the act of seeing and of the delight which it gives? It is contended by some that we are as truly and as properly said to be conscious of the object as of the subjective state. Others urge that it is a gross impropriety to say that we are conscious of the landscape, except in the general sense in which we use *conscious* as the equivalent of *knowing*. (§ 66.)

The truth is, that we are conscious of the object somewhat as we are conscious of the *ego*. The state or operation is the central object of apprehension; but as the state cannot occur nor be known except as having

The *Ego*, not the whole substance of the soul.

Consciousness of the object.

a relation to the unchanging *ego*, so each separate state is rendered determinate in part by its object. This is especially true if the state be pre-eminently a state of knowledge. We distinguish one state of knowledge from another by what we know; e. g., in one moment I perceive a tree, in another a house, etc. How can I be conscious that I perceive a house or a tree, except by noticing the relation of the act itself to the house or tree?

We do not say that the whole difference of a psychical state is thus determined; for, to see a house may, purely as an act of knowledge, differ from the act of discerning that two straight lines cannot enclose a space. Besides, an act of knowledge never can occur by itself, pure and separate from all feeling, desire, and will. States of feeling and will are known to be purely subjective, and to pertain to the soul itself, and to the soul alone. These subjective elements attract the notice of consciousness preëminently, and these mark and individualize them to the soul's memory. But when they are described in language or recalled to the thoughts by an explicit statement, they are described by their objects. Even the state of the most absorbed feeling is indicated by the object or event which excited the emotion. We say, 'I was conscious that I saw the tree, or clearly discerned the mathematical truth,' or, 'I was conscious of keen and rapturous delight from the view or the anticipation.' We cannot conceive it possible that we should know that we know, enjoy, or choose, without knowing *what* we know, enjoy, or choose. In other words, in being conscious of an act or state, we must be conscious of the state or act in relation to, and as therefore including the object.

From the fact that we cannot be conscious of the operation without being conscious of its relation to the object, Hamilton reasons thus: "Consequently consciousness is not a special faculty, but a faculty comprehending every cognitive act, or it must be held that there is a double knowledge of every object—first, the knowledge of that object by its particular faculty, and second, a knowledge of it by consciousness as taking cognizance of every mental operation."—*Met. Lec.* 12. To this we may reply, the dilemma is avoided by conceding that in every case of the kind adduced, viz.: in every act of sense-perception, we perceive the table or ink-stand, and we know, i. e., we are conscious, that we perceive the ink-stand. These two acts are distinguishable in thought, though not separable in fact. This Hamilton himself concedes and contends for. But we cannot perceive the table, without recognising some relation of the act to the object. Nor can we be conscious of the act of perception, without being aware of some relation of the object perceived to the act of perceiving. When the chief energy of attention is expended upon the object—the material object—not without some recognition of its correlate, the act of perceiving, then we have, as nearly as possible, a pure act of sense-perception. But when the mind is mainly concerned with the act, not to the entire exclusion of the object, then the act is as nearly as possible an act of pure consciousness. Or if we suppose the same object, the table, to be continuously an object of sense-perception, and the attention to be varied from the process to the object, and conversely: then perception alternates with consciousness, the one never excluding the other, as is provided for in our definition, and as is attested by experience. As to the question whether consciousness is a special faculty, Hamilton himself concedes all that any one need contend for, when he says, (*Lec.* 13): "We admit at once, that were the question merely whether we should not distinguish under consciousness, two special faculties—whether we should not study apart, and bestow distinctive appellations on consciousness considered as more particularly cognisant of the external world, and on consciousness as more particularly cognisant of the internal—this would be highly proper and expedient."—(*Cf.* *Lec.* 29.) The question is then one of nomenclature—(A) is consciousness to be used as a generic term = knowledge, of which the two, sense-perception and self-consciousness, or consciousness, are species; or (B) is the appropriate generic term knowledge, with the two or more species under it, sense-perception, consciousness, etc., being coordinate with one another? Hamilton's theoretical answer to this question is quite inconsistent with his practice. In his theory he gives the answer (A); in his practical use of the terms and treatment of the subject, he follows (B).

Summary respecting the object of consciousness.

§ 83. We conclude then, thus: The object of consciousness is a state or act of the soul; this state or act must occur or exist in order that it may be known; but it does not exist before it is known in the order of time, but only in the order of depend-

ence, or of logical necessity. So far as the order of time is concerned, it exists while it is known. But what is known of this object must depend on the nature of the matter to be known, and also on the reach or capacity of consciousness in its attentive inspection.

A psychical act or state, as we have seen, is in its nature complex, consisting of three elements in intimate relation to each other: the *ego*; the object; the acting or suffering of the passing moment. But the act or suffering is inconceivable, except as belonging to the *ego* and occasioned by the object. Of this double relation consciousness must take notice. It must, therefore, also take notice of the terms or elements to which it is related.

The object of consciousness is a being.

§ 84. We observe still further, that consciousness the object, as contradistinguished from consciousness the act, is a state or condition of being, as contrasted with an act of knowledge. It has already been asserted, that, to know, supposes and requires being as its objective correlate. The being, known by consciousness, is a spiritual being, a permanent identical agent or producer of states and acts which are known; i. e., a being in the eminent and higher sense, substantial or real being (cf. P. IV. c. vii). This the mind knows to be, or to exist, by a direct or immediate act of its own. Consciousness as an act, is the energy of a knowing or thinking agent. Consciousness as an object, is the spiritual being discriminated from the act by which it is known, and discriminated as a being which is apprehended really to exist. In every state of consciousness, knowledge is directly confronted with being in the same psychical state, and the being which is known is affirmed to be identical with the being which knows.

Special import of *cogito, ergo sum*.

The saying of Descartes, *Cogito, ergo sum*, has preëminent propriety and obvious truth when applied to the act of consciousness. It means more than, I find myself a thinking being, and therefore I, the thinking being, exist; but it means *conscius sum*, that is, I know directly the activities of a being, which being is myself; its existence I directly apprehend and affirm. It has been said with eminent truth that absolute skepticism is incompatible with the act of consciousness; because, if I doubt or question any reality, or whatever reality I doubt or question, I cannot doubt or question that I myself doubt or question. The same truth is more strikingly confirmed by the view already taken, that in consciousness as the act there must be present and known consciousness as the object; and this object is a substantial existing being, known or affirmed by the very act of consciousness to exist.

Skepticism emphatically excluded.

Not only is absolute skepticism excluded by the analysis of the act of consciousness, but absolute idealism is excluded as truly and as effectually. The object of consciousness is not a thought-object, but a thing-object. The being known is not a phantasm, or notion, or spiritual product, but it is a substance, the self, or *ego*, existing in some definite state or condition. In consciousness, I am

confronted not with a thought, but with a being. Whatever else may be unreal—whether idea, phantasm, or speculation; this acting and suffering self is a reality—not a mere phenomenon as contrasted with a transcendental *ego*, nor an *ego* inferred, assumed, or suggested, but an *ego* directly known to be.

The conscious act does not create its object by the act.

The mind, in an act of consciousness, does not create the state or condition which it knows to be. It only creates the act, so far as it knows the act or state to be. That which is known, is produced by another activity of the same being. The states or conditions of being of which we are conscious often spring up unexpectedly, as it were, beneath our feet, or they break in upon the field of view unannounced, and they are often very unwelcome. Often their existence and presence are beyond our control. The being of whose states we are conscious is also often in no sense an actor or producer, but a sufferer and receiver. In such suffering and passive conditions of being, the most obvious of which are bodily sensations, the being which we know, is easily and strikingly contrasted with the acts by which it is conscious of its passive or recipient condition, if it be not known as acted upon by other beings also.

Validity of relations also established.

§ 85. The reality and validity of *being* is not only thus established, because involved in the apprehension of consciousness, but the relations of being are as necessarily affirmed in the same activity. The several states of the soul are not only discriminated as diverse from one another, but they are known to be like and unlike. They are also known to be produced by the soul which is conscious, or knows, that they exist; that is, they are known under the relation of causation.

The soul a microcosm.

In view of these facts, we need not wonder that even the ancient philosophers counted the human soul, thus known by and to itself, to be a microcosm or epitome of the great universe. In the spirit of man, and in the exercise of the simplest and the most essential of its powers, thought and being are both conjoined; the one is confronted with the other, the one is essential to the other. Thought is perpetually springing out of being, and apprehending being to exist—not only simple being, but being in all its forms of activity and the relations which they involve.

All the categories involved in consciousness.

We shall not be surprised to find that all the conceptions which are necessary to scientific knowledge—those categories which cannot be proved, but which must be assumed—those prime relations and first truths on which all our higher intelligence of matter or spirit depends, are affirmed of spiritual being in the act of consciousness itself. It is natural to man to make himself the measure of the universe—i. e., to take the little universe of being, which he knows so directly and so well, with the relations involved, to be the analogon of the greater universe which lies beyond, and which is more indirectly known. At all events, whatever relations and facts he finds it necessary to affirm of his own being, he will not hesitate to apply to the whole universe without. This is the process by which many explain our belief in these categories or first truths.

Man assumed to be the image of God.

Many go further, and find not only in this microcosm an image of the larger finite universe beyond, but also an analogon of its Creator. As man in consciousness thinks this world of being into thought, thus producing a thought world by his creative power, under the limitations which are imposed by the materials, both objective and subjective, which his nature as existing and knowing, impose

upon him, it is only needful for him to conceive these limits removed, and he forms to himself a conception of the God in whose image he was made: and by the fact that he exists in His image he is able to understand the properties and laws of the universe of both matter and mind as he interprets in them the thoughts of its Creator.

Development and growth of consciousness. § 86. It has been already stated that consciousness, though natural and necessary to every human soul whose powers are normally developed, is not exercised at the beginning of its existence, but only after certain conditions and stages of growth have been attained, and the power to apply them has been matured. The order of this development and maturity may be sketched as follows:

Unconscious life. The first activities are those of simple life. These, whether they pertain to the body or the soul, are unconscious. All forms of reflex nerve-action, all the purely instinctive movements of either body or soul, or of both combined, are known to be unattended by conscious apprehension. But all these activities are exercised in great number and for a long time before the experience of sensations. As soon as a sensation occurs, whether painful or pleasant, it must be felt. **Sensations and self-feeling.** It is essential to its very nature to be experienced by a sentient being, and to be felt as painful or pleasant. This experience, whether in man or animal, involves some sort of possible apprehension of self as the subject of its pain or pleasure. This is not consciousness, real or possible, as we use the term, but only consciousness in its lowest and most rudimentary form. By some it is called the feeling as distinguished from the knowledge of self, or self-feeling in its beginnings. In order that consciousness in its lowest stage should occur, the several sensations should not only be experienced, but they must be discriminated from one another as this and that, the sensation as now and then, the sensation as sweet and bitter, cold and hot; and *this* sensation of sweet, *that* sensation of bitter, etc., etc. As long as the sensations are confused together, and are not discriminated, whether they are weak or strong, the soul remains in this elementary condition of comparative unconsciousness. This is the condition of the infant. It is also the condition into which the developed man relapses in swooning, distraction, intoxication, or approaching sleep. In the infant such a condition cannot be remembered, for reasons which we will give in their place (§ 295). The man can recall it but dimly, and only as he measures and imagines the state, by contrast with those of which he is distinctly conscious, and which he can clearly recall.

Sensations discriminated. But when the several sensations are discriminated from one another, the soul reaches a higher stage. But even this does not involve consciousness, unless the sensations are also discriminated from the self to which they pertain.

Observation attests that the one is possible without the other. Even the external objects that occasion the sensations, may be distinguished from one another and from the sensations which attend them, before the soul distinctly recognizes the sensations as its own. No fact is more patent to universal observation, than that, in infancy and childhood, man is occupied with the objective, with very infrequent cognition of self as contrasted with his sensations or their objects, or the impulse that carries the feelings and actions without. It would seem that all the impulses that follow the bodily sensations—*e. g.*, the animal appetites—carry the soul still further outward, and hold and hinder it more effectually from the recognition of its own being or agency. Even the man who has outgrown this condition, and been raised above it by refinement and moral culture, sometimes falls back into it. "Every man can occasionally catch himself in the state of losing himself in the act of eating or seeing, and, as it were, burying his consciousness in the function of some single organ of sense. States of this sort have always in them something of the animal."—HELFERRICH, *Ory. d. Wiss.*, p. 88.

Emotions distinguished from sensations.

As soon as feelings of another character are experienced—emotions proper, and not sensations, emotions which are perhaps antagonistic to sensations and their impulses—the opportunity is presented for the soul to distinguish its own agency, and itself as an actor or sufferer, as contrasted with itself as purely sentient; i. e., carried out of itself by its sensations and appetites. It now furnishes in itself the condition for that reflex act which we call the conscious discrimination of its states as its own. It now can know itself as an actor and sufferer. The act of consciousness is not explained by its conditions. It is not developed from nor produced by these conditions. But it does not occur before these conditions are furnished, and these conditions do not exist till the soul has reached a stage of development that is somewhat advanced. When these conditions do present themselves, the act of consciousness is performed, in and by which it discerns its object to be. In other words, under these conditions, consciousness the act and consciousness the object, as we have described them, are possible and actual.

The first step which the child makes toward the cognition of self, is to distinguish its body from other bodies and other persons. When it knows its name it applies it first to its body, and usually speaks of this self in the third person. It is a great step forward when it can use the pronoun I, a step not taken till the child has developed decided wishes, and some exhibition of character, in the form of emotion, passion, or purpose. Jean Paul Richter records of himself: "Never shall I forget the phenomenon in myself, never till now recited, when I stood by the birth of my own self-consciousness, the place and time of which are distinct in my memory. On a certain forenoon I stood, a very young child, within the house-door, and was looking out toward the wood-pile, as, in an instant, the inner revelation, 'I am I,' like lightning from heaven, flashed and stood brightly before me; in that moment had I seen myself as I, for the first time and forever!"

The baby, new to earth and sky,
What time his tender palm is pressed
Against the circle of the breast,
Has never thought that this is I.

But as he grows, he gathers much,
And learns the use of I and me,
And finds I am not what I see,
And other than the things I touch;
So rounds he to a separate mind,
From whence clear memory may begin,
As thro' the frame that binds him in,
His isolation grows defined.

TANNYSON.—In *Memoriam*, xlv.

The self not the ego.

The object discerned by the act of consciousness is not, as we have already observed, the soul itself, as a substance or subject, with all its capacities and powers; for, besides those which consciousness apprehends, there are those which it does not reach. Even the cause or source of many which it does discern are beyond its direct cognition. In all of these operations the sentient nature acts out of sight, receiving or rejecting those objects for which Nature has or has not adapted its action. Even after the soul acts and appears as the *ego*, and, as such, is the conscious subject of its higher acts, it also acts as the unconscious subject of many others. As the subject of many similar acts and states objectively known to the conscious *ego*, is it called the self; as the agent which is actor, and also conscious of individual acts, is it called the *ego*, or I. Pre-eminently is it the *ego*, or I, when it makes itself manifest as the regulator or controller of the blind impulses and desires by an act of will. This *ego* is known as identical with itself. It is the same *ego* which yesterday and to-day observes the changing states of the identical self which it makes the object of its knowledge; otherwise it could not connect these states as past and present, as experienced now and remembered yesterday. It could not regard them as its own. It could not combine them as similar into a concept, nor unite them in a class. Above all, it is the same *ego* when it holds the same purpose unchanged, and can repress and overcome its own changing moods, and the solicitations of others, by an unvarying and continued purpose.

Differences in individuals. The act of conscious self-apprehension may also be more or less frequently exercised by different men, after the capacity for it has been reached. The conditions for its exercise, after the power has been matured, may be more or less favorable. First, the objective conditions may be more ample and energetic in one man than in another. The corporeal nature of one may so hold the spirit by obtrusive and engrossing sensations as to preclude the possibility of that discrimination which is the first condition of conscious knowledge. Thus the body of the idiot or the half-witted may so preoccupy the energies as to detain it almost in the animalized state. Moral obliquity, especially in early life, may almost literally brutify or animalize its condition. Various morbid conditions of the body may come in at an early period of the soul's development to arrest its natural progress, by filling up its experience with continued sensations of weakness and pain. Even a low energy of vital force may give to consciousness only feeble sensational activity and inert impelling forces, which are too unobtrusive to elicit discriminating cognition. The occupations, cares, and interests may be so material and sordid, as to fill up the life with activities that are solely objective. The psychological nature of one person may also be far richer and more varied in its capacities than that of another, furnishing the material for conscious observation that is comparatively copious and inviting. Second, the subjective capacity of conscious activity differs in degrees in different persons. The natural power, the acquired facility, and the inclination to look inward, are stronger in some than in others; and hence in some men that is a passion which in others is rarely and ineffectually performed. Nature, habit, and art exhibit surprising diversities and contrasts in this respect.

The capacity for consciousness not developed. This leads us to repeat the remark already made, that the capacity for consciousness is not the product of accidental conditions or circumstances, nor is it the result of any development from any lower existence, but is provided in the nature of man and the designs of his creator. The brute is not self-conscious under the most favorable circumstances, nor can he become so as the result of any development whatever. He may be like man in the lower stages of being, in the experience of what we call bodily sensations and animal appetites; but he never discriminates one sensation from another by a self-conscious act, simply because he has not the capacity. Much less does he distinguish the self from its states, because there is no self and no states to be thus distinguished. Hence he cannot, in the proper sense of the word, remember, nor generalize, nor reason, nor judge, so far as these involve the reference of acts or objects to himself by appropriate acts and products. He cannot purpose or choose, for a similar reason. Neither the objective conditions of these acts are furnished in his own nature, nor is the subjective capacity to discern them.

Consciousness not a product of circumstances. This leads us to repeat what has before been said, that consciousness as act and object, though developed in the progress of the soul's history, is not in any sense a phenomenon produced by the soul's powers in connection with certain objects or conditions. Consciousness as an act, or power to act, is the power to know what actually exists. The power to know does not make that to exist which is simply known to be. The object of consciousness is not a phenomenon or phase of the soul, but the soul itself as at last apprehended in its higher relations, and as exercising its nobler activities. The fact that this *ego*, or self, is also capable of other activities of which it is not conscious; the fact that it acts as vital force in forming and nourishing matter as, and into the body—which facts are not known to consciousness—do not disprove the more important activities which consciousness does apprehend, nor do they make nor prove that what consciousness does know—viz., the self, or the ego—has not real being. The order and law of knowing is not the order or law of being. The fact that the power of the soul to know itself is developed last of all in the order of time, does not cause what is known to come into being at the time when it is known, nor its being to result from any process of development at all. The soul is consciousness knows a fact; it does not make the fact to be.

Latent modifications of consciousness.

§ 87. The question has been discussed of late among English psychologists, whether there can be any latent modifications of consciousness. The phrase is infelicitous, because apparently self-contradictory—a *latent* modification of that which, in its very essence, is an act or an object of *knowledge*, being apparently, both in term and thought, impossible. The truth which the phrase was designed to describe is, however, real and important, and deserves to be clearly stated. That the soul may act without being conscious of what it does, or even that it acts at all, has been already established. That these unconscious acts affect those acts of which it is conscious, and their objects, is also evident. A sharp distinction has been made between those processes by which the soul, so to speak, prepares objects for its conscious apprehension, and the acts of knowing these objects when thus prepared. It is equally clear that the soul, by acting consciously, prepares products which it can preserve and can recall, and that, by acting often and energetically, it strengthens the power to preserve and recall, by processes which it cannot consciously follow out nor explain. All the effects of this kind of its conscious acts, are accomplished by modifications of the soul which are latent—i. e., unknown to the direct inspection of consciousness.

Consciousness susceptible of degrees.

Many of the instances cited of such modifications, are only examples of objects observed with less attention—objects comparatively unheeded, which may be afterward revived with greater distinctness. For example, I write hastily, to-day, a word or a phrase which is incorrect or ungrammatical. I do not notice the error, but I recall it to-morrow, and notice the mistake by an act of memory. Or, I see a person, and, at the time, do not notice some article of his dress or some peculiarity in his look or language, but recall either distinctly on reflection. Or some part of a total perception, as of a crowded and active company, or a varied landscape, apparently escapes my notice. It is a mere accessory, a subordinate, quite overlooked in comparison with the central figures or objects; and yet it may serve as a link in the restoration of a train of connected objects. These objects are not latent, though very little attended to. The processes which they affected were, as all the processes of recalling by association are, wholly out of consciousness; consciousness being only capable of discerning and recognizing objects when presented, but being wholly unable to follow the act by which A is connected with B, or by which B subsequently brings A before the conscious mind.

Leibnitz (*Nouveaux Essais*, ii. c. i.) cites the case of the sound of the sea as an example. A single wave does not affect the ear, but only many, when combined. And yet each wave must contribute its share in affecting the conscious mind, or the whole could not be heard. A distinction is to be made in this instance between the impulse of a single wave upon the organ of hearing, and the experience of the sensation. The action of many waves together may be required to bring the organ into that condition which effects the sensation in question, or any

other. To the total effect upon the organ each wave may contribute its part, without moving the consciousness in the least, even latently.

The general truth cannot, however, be controverted, that the unconscious and conscious processes of the soul act and react on each other continually, and that neither should be overlooked in the science which explains its phenomena. Consciousness, though the most important, is not the only source of our knowledge of the soul, and its powers and laws.

CHAPTER II.

THE REFLECTIVE, OR PHILOSOPHICAL CONSCIOUSNESS.

HITHERTO we have considered consciousness as the common endowment and universal characteristic of the human race. Every human being is capable of being conscious of his psychical states. Every man who is normally developed becomes actually conscious of these states at a very early period of his existence. The exercise of this power connects him with his kind by the capacity for human sympathy. It enables him to recognize as true the descriptions of human experience which are given by the dramatist, the novelist, and the philosopher. It qualifies him to try the statements and theories of the philosopher at the court of ultimate appeal—i. e., his own conscious experience. This is *natural*, or *primary consciousness*.

The reflective consciousness contrasted with the natural consciousness. § 88. We have, however, distinguished and defined another species of consciousness. This is the artificial, or secondary consciousness, and it is attained by comparatively few. Though all men can understand and appreciate the descriptions and appeals of the dramatist and the orator, there are but few who can originate and apply them. Though all men experience the phenomena which the philosopher records, classifies, and accounts for, and in a certain sense can judge of the truth of his assertions, there are few who observe these phenomena with reflection even by such aid; and the number is very small who can originate an analysis or comparison. The consciousness which understands and assents, is, in some important respects, distinguished from that which discovers and proves. And yet the one power must have an intimate relation to the other; else the truth which the philosopher originates would be beyond the reach of the man who receives and assents to it. The consciousness which discovers and teaches is properly called the *philosophical* and *reflective* consciousness. These characteristics may serve to distinguish the two species of consciousness in general; but we ask more particularly, 'What is the reflective consciousness? and what are its relations to the natural consciousness?' In answer to the first of the questions we say:

The reflective consciousness defined.

§ 89. The reflective consciousness is the natural consciousness exercised with earnest and persistent *attention*. It has already been shown that every intellectual power may be

used with a greater or less degree of energy. We have also seen that the development of the natural consciousness through its successive stages is but the development of an increase of attention. When this habit is carried to a still higher degree of energy, and the subjective states and activities become as familiar and as frequent objects of contemplation as material objects are to the mass of men, then consciousness is transformed into reflection. The natural and the spontaneous becomes the artificial and reflective consciousness.

That the ordinary consciousness should be intensified to the extraordinary, is not entirely strange to the experience of men who are habitually unaccustomed to reflection upon themselves and their own psychical processes. It not infrequently happens that the inattentive and unreflecting, is so startled by the fire and energy of his own feelings, as to look in upon himself with wonder. Or perhaps such a man is surprised to see in some feat of memory, some rally of the imagination, or some sagacious conjecture, a revelation of internal power and resources on which he had never dreamed, and which has astonished him, somewhat as the vein of silver is said to have astonished the savage who caught at a shrub and exposed the lode beneath, that led to the mines of Potosi. Such revelations have been to many a boy and man the beginning of a new life.

It may help us still further to accept the possibility and to understand the nature of consciousness as modified by attention, to consider it in the two forms of the *morbid* and the *ethical self-consciousness*.

The morbid or the abnormal self-consciousness is that kind or degree of attention to one's own psychical states which interferes with the normal use and development of the powers; which is inconsistent with the health, the comfort, and the successful activity of the body or the soul. Children are appointed by nature to an objective, and, in one sense, an animal life. The soul needs to be thus occupied, to accumulate the stores of facts and dates, or words and phrases, which it may afterward turn to a higher use. The imagination naturally constructs and invents with creative affluence, and it colors and gilds whatever it creates. But now and then a child, through an unfortunate bias, or some ill-judged training, has been led to look inward upon itself with unnatural precocity. As a consequence, the subjective predominates over the objective, the power to reflect excludes the power to acquire; and that easy and spontaneous play of observation, memory, imagination, wit, and invention, which is the strength and the charm of childhood, is excluded or hindered.

Among adults many examples occur of a morbid or unnatural attention to the inner life. Hypochondriacs, who are haunted by disturbing sensations which come from some bodily disease, till their attention is so absorbed in watching their sensations that it cannot respond to the objects that are fitted to amuse and inspirit them, furnish one example. Men who have inherited or indulged a sensitive nature till it has become their tyrant; who watch their feelings with a selfish exclusiveness, or who pamper them with a dainty fastidiousness, become, like Rousseau, half insane through brooding over their own exaggerated sufferings and wrongs. Hamlet is a striking example of an affectionate and heroic nature, shocked by the occurrence of a terrible calamity, that first forced him to be suspicious of his fellow-men, and then taught him to distrust himself, till his "native hue of resolution" was "sicklied o'er with the pale cast of thought." Skeptics, whether philosophical or religious—men who carry the impulse to question and investigate to the excess of distrust and doubt—usually terminate their career of distrust by turning their eyes inward upon the workings of their own souls, and find there the simplest field for questioning the validity of the laws of their own being and the facts of their own consciousness.

The morbid consciousness in children and adults.

Another type of the abnormal consciousness is that which results from an egoistic thoughtfulness of one's appearance, manners, words, looks, actions, or achievements, which shows itself in the countless forms of affectation that are displayed in society, as well as in literature. They all have this common feature, that the person thinks more of himself than is wise or healthful. So common has this become in the artificial society of modern times, that it has given a new sense to the words *conscious* and *consciousness*, with and without *self* as the prefix.

The ethical type is that attention to one's inner states which is applied in view of a moral standard, for the purposes of self-correction and self-improvement. The ethical consciousness. In order to judge one's self, a person must know or examine himself.

He must attend to his own thoughts and feelings, so far as is requisite for these ends. This is so obviously required, that the word *reflection*, which originally signified the reflex action of the soul upon itself, has acquired a secondary signification, in its use and application for ethical purposes. This kind of reflective consciousness always brings with it some intellectual discipline. The person who habitually scrutinizes his motives and examines his feelings in the light of the law of duty and of God, cannot but cultivate and strengthen his intellect by the process, however humble may be his calling and illiterate his education. Christianity has trained the intellect of the human race to this activity, and hence has been so efficient in educating and elevating the masses of men, even when it has furnished no special intellectual culture.

§ 90. The type of the reflective consciousness with which we are specially concerned is that which is properly called *philosophical*, because used for scientific ends. It has this in common with the types already referred to, that it involves attention as its special and essential element. But the attention must be employed in a peculiar way, with distinct reference to peculiar ends, and with the aid of special appliances, if it is to yield important scientific results. Its characteristics are the following:

§ 91. First: It is persistent in its observations. It not only attends to the phenomena of the soul as inclination or duty may decide, but it attends continuously, with the definite aims of careful observation and accurate remembrance. But how can the mind attend continuously to the same mental state? Of material objects many of the phenomena are permanent; they address the senses as being the same objects. We can observe them again and again, till we are certain that we have attained a definite impression, and can bring away a satisfying recollection. But the mental object is but for an instant. If we look for it, in order that we may look at it the second time, it is not there. It existed only so long as, by our own act, we gave it being; and when that activity is intermitted, the object which we would fain examine by a second look is no longer and nowhere to be found. The only resource which we have, is to prolong the state by continually renewing or repeating it. To this act or effort of prolongation Locke gives the name of *retention*, and this he describes as a peculiar mental act (*Essay*, B. ii. c. x. § 1). But can we prolong a single state beyond its assigned period of time? Is not a single state limited to a definite period of duration? The question is trivial, and it is of no consequence how it is answered.

Whether we can prolong a state or not, we can certainly repeat it again and again, allowing no other activity to intervene. As we thus repeat the activity in a series of similar acts, we present to our consciousness substantially the same object, and so secure an opportunity for bestowing upon it that continuous or sustained attention which is essential to exact observation. What we fail to notice at one look, we catch by another. What we only faintly apprehend at the first sight, we fix and confirm by the second. What we observe incorrectly or partially in one act, we discern truly and completely in the act which follows. This retention or repetition of the object becomes the condition of the continuity of the act of consciousness, and hence it is a distinguishing characteristic of the philosophic consciousness. It is because the mind does, as it were, turn in upon itself, that this effort of consciousness is termed *reflection*—i. e., the bending back or retortion of the soul on itself. It is because this repetition of the object, or retortion in the act, is found to be practically necessary, in order to any accurate and successful observation of consciousness, that consciousness the act, has been supposed to be a remembrance, a sort of second thought, and the power has been resolved into memory (§ 75). Second-thinking is, indeed, necessary to reflective consciousness; and not only second-thinking, but a sustained and continued application of the attention to the continuously repeated act.

Other advantages are secured by this repetition of the mind's activity, and one especially, that it is capable of being viewed more coolly. When the soul first goes forth into an act, its conscious apprehension of what it does or suffers is inversely as the direct energy by which it produces it. If it reproduces its like immediately, this may be entirely similar to the original in the kind, and yet greatly unlike it in the degree of its energy, leaving the remainder of the soul's energy to be employed in the reflex attention to it. If I am absorbed by the beauty of a splendid picture, or a glorious sunset, I shall not be likely, when these objects first break upon my sight, to give much attention to the act or process by which I view them in order to ascertain their exact nature, or to the emotion with which I am literally rapt or carried out of myself, to discover whether there is more of delight or wonder. But when my curiosity is satisfied, and my feelings are calmer, then I have some energy to withdraw from the act of seeing and the feeling of admiration, which I can employ in reflex attention to the act and the emotion. But even in the energy of my first perception and the tumult of my first emotion, I noticed these very states sufficiently to remember that they were like the less excited and absorbed states that follow, which allow the chief energy of the soul to be employed in reflex attention. Facts like these throw a flood of light on the necessity of repeated activities of the soul, in order both to furnish the subject-matter for its reflex action, and in order to enable it to reflect with profit.

It attends to all the psychological phenomena.

§ 92. Second: The philosophical consciousness is comprehensive in its observations. It brings within its field of view all the phenomena of the soul. Its object being to know all its powers, it must of course consider and attend to all its phenomena. The philosopher may not, like the man of morbid or abnormal tendencies, give an exclusive and one-sided regard to certain feelings, or to a few species of intellectual acts; but he must regard all the variety of experiences

of which his being is capable, omitting none, being partial to none, doing full justice to each and to all—to each in its separate agency, and to all in their mutual and conspiring harmony. This principle is so obviously just and fundamental, that no reasons need be given to justify or enforce it. It is accepted as a cardinal maxim of the inductive method; to whatever object-matter this method is applied. To scientific knowledge of every sort, it is essential that all the facts should be fairly considered. Nature is an honest witness, and stands pledged to tell not only the truth, but the whole truth. Those who examine the witness are equally bound to hear *the whole truth*, and to open their minds to attentively consider it.

§ 93. Third: The philosophical consciousness attends to psychical phenomena, in order that it may compare them; and it compares these phenomena, in order that it may unite those which are alike, and distinguish those which are unlike. Its aim is scientific knowledge; and science is knowledge that is comparative and discriminating. In other words, it is classified and arranged knowledge. Or it may be defined as facts seen in their widest and most comprehensive relations. It is not sufficient that we attend to the facts of the soul apart; we must compare them together, in order that they may be classed and distinguished, and reduced to the order and symmetry of a completed system.

The power to discern relations sharply, surely, and quickly, may to a certain extent be a special endowment or gift of nature. Its successful exercise or application, however, is the result of attentive comparison. The observer must bring the facts together, placing them side by side. He must then look at them in their connections, leaving the various relations to suggest themselves. He must also unite those which are alike, and discriminate those which are unlike. By whatever method or from whatever source the facts of the soul come to notice, whether by reading, memory, or observation, they must, when present, be brought together by the comparing attention.

§ 94. Fourth: The philosophical consciousness *interprets* the phenomena which it unites and discriminates. In other words, it explains them by a reference to powers and laws. The classification of phenomena is a condition of science, rather than science itself. It is science begun, but not science completed. The object of science is to ascertain what is familiarly called the nature, essence, or constitution, whether of the material or the spiritual beings with which it has to do. It may not be easy to define what is intended by these terms (§ 426). It is obvious, however, that something more is meant than a bundle of classified phenomena. They are supposed to indicate or reveal some power which the being possesses. The phenomenon is to the power as an effect is to its cause. The power is conceived as a capacity to cause some result or phenomenon. Hence science is said to be the investigation of causes, principles, or powers. The scientific consciousness, therefore, *reflects*, that it may refer phenomena to their causes or powers, in the soul.

But powers, whether material or spiritual, do not act except under conditions. Some other being, agent, or condition, must be present in order that the power may be actually exercised. The soul, though self-active, as has been explained, is yet dependent on material conditions for the beginnings of its activity, and for many of the objects which direct this activity. But inasmuch as the soul is self-active, it is also very largely dependent on itself for the conditions of its acting. But whatever these conditions are, and whencesoever they originate, they must be ascertained, in order that the philosophical consciousness should complete its work and attain its appropriate objects.

But again: The powers or agents of nature act according to laws. These laws are fixed methods or rules according to which phenomena occur, when the conditions of their presence are furnished. The laws of the soul are, therefore, to be discovered and established, in order that the science of the soul may be complete, and the objects of the philosophical consciousness may be accomplished. We have already adverted to the reasons which lead us to presume that the essence, the acts, and the laws of the soul differ from those which belong to matter and are the subjects of the physical sciences. That the soul has laws of its own, is highly probable; but the duty is none the less imperative to discover and fix these laws, whatever they may be.

We have already answered the question, whether there is not one method common to both spiritual and material phenomena, viz., the inductive method, whose principles and maxims have long been fixed and acknowledged. There is but one method of inquiry for the two classes of objects; but it is one of the fundamental principles of this method, that full and complete justice should be done to the powers and laws which are appropriate to any class of agencies, provided that their existence and action can be fairly proved—i. e., can be established on satisfactory evidence, and reveal themselves to the appropriate means of observation. It is also not to be forgotten, that the analysis of psychological phenomena involves at last an analysis of the processes and laws of induction itself, giving thus to psychology a profounder import and importance than belongs to any material science.

Relations of the philosophical to the natural consciousness.

§ 95. Our second inquiry respected the relations of the natural to the philosophical consciousness. These relations need to be more fully considered. It has already been explained that all the phenomena of the soul which are used by the philosopher in his completed science, occur under the eye of the natural consciousness. Neither the natural, nor the reflective consciousness creates these facts; they only observe them; the one cursorily and to little scientific purpose, the other patiently and with comprehensive and sagacious comparisons. Consciousness does not call the facts into being, nor does reflection introduce us to a new world of its own creation; but both observe these facts, yet in a different way. Psychology does not add newly-created phenomena to our stock of knowledge, nor even in one sense newly-discover

ered facts; but only old and in one sense well-known facts, now carefully and comprehensively observed and exhibited in new relations. The facts, and many of the relations of the facts, are as obvious, and in one sense as truly known, to the peasant as to the philosopher. When the philosopher teaches the peasant, he does not impart new knowledge concerning the soul, by mere testimony, on the authority of his own observations and experiments, or those of others; he simply teaches him to attend to the phenomena of his own inner self. He says to him, Look, and you will find this or that. Observe this and that phenomenon together, and you will see wherein they agree and wherein they differ. In short, he only teaches him what in one sense he knew before.

Does the philosophical consciousness impart new knowledge.

§ 96. But does not the reflective consciousness discover and impart *new* knowledge? Most certainly. It by no means follows, because the natural furnishes to the reflective consciousness all its facts, and the reflective must go to the natural consciousness for all its materials, that the philosophic consciousness makes no important additions to the stock of human knowledge. The same starry heavens are pictured on the eye of the stupid or superstitious savage, as upon that of the scientific astronomer; but how much more does the one see in them than the other! A simple child and a skilful engineer look upon a steam-engine, both in one sense seeing the same objects; but how much more does the one perceive in the engine than the other, of the powers, the laws and the uses of each separate part, and of their action with respect to the whole. The same natural consciousness is the common possession of the race; but how great is the store of important scientific truth which reflective thought has superinduced upon, and discovered in it. Indeed, it is easier to lead the savage up to the sublime generalizations of astronomy, and to teach the child to comprehend the intricate relations of the steam-engine, than it is to make them familiar with the facts and principles of psychological science. To unveil to a man his inner self imparts more knowledge that is novel and strange, than to teach him astronomy and mechanics.

Illustrated by the knowledge of the ego and the self.

The difference between the knowledge given by the natural and that acquired through the philosophical consciousness, is well illustrated by the individual conception of the *ego*, which is common to all, and the generalized conception of the *self* which is the product of reflection. The consideration of this difference illustrates the relation of the one species of consciousness to the other. In every act and condition of the natural consciousness there is necessarily present, the recognition of the *ego*, as the unchanging subject of the changing states of the soul. It is plain that neither reflection nor memory can create or evolve this knowledge; for both reflection and memory presuppose and require it as their essential condition. It must be given to the mind by the intuition of the natural consciousness, or it is not given at all. But it is the intuition of the *individual ego*—the one single being to which, and to which alone, belong the various and changing states which are its experiences and its doings, or rather into which it is constantly passing by suffering and by action.

The conception of the self, which is expressed in language and defined by its constituents,

elements or characteristics, is the generalized product of the philosophical consciousness. A *self* is one of the individual agents or *egos*, so to speak, which is like every other, in those common characteristics or powers which make them alike. It is, however, an *ego* stripped of its individuality by the process of abstraction, and considered only in those attributes and qualities which it has in common with others. The self, or this self, or my self, is this individual one of the *selves*—the *ego*, to which this common conception is applied, and of which it is predicated. These general attributes are known by their manifestations. In other words, we reflect upon its actings and experiences, and observe what it has in common with others of its class. We observe, also, what special or peculiar powers it has exhibited, by which it is distinguished from other human souls and shows itself worthy to be set apart into a more limited or lower species. In order that either of these conceptions of an individual *ego* should be formed, it must have existed for a longer or shorter time, and had opportunity to manifest and develop its natural or perhaps its acquired peculiarities, in various forms of act and suffering. To do this, it must have had the opportunity of acting. The various occasions that are necessary as the sphere of the soul, must also have been furnished. Not only must the *ego* have lived and acted in various ways, to present the material for the reflex consciousness to work upon, but these manifestations must have been considered in all the ways necessary for philosophic results, in order that it may be considered as a *self*, or any species of a *self*. On the other hand, the natural consciousness must begin with the apprehension of the *ego*, as the condition of knowing a single mental state. It cannot connect one with another except by the apprehended identity of this *ego*. We begin with the natural consciousness of the individual *ego*, and end with the philosophical concept of the self; with its nature and capacities as developed in the reflective consciousness, by which nature we explain its various single phenomena as occurring according to the essential laws of its being.

So, too, when we conceive of the self in its ethical relations, we consider the individual *ego* as possessed of a character, that is the result of its own free activity, and yet is described and judged by the marks of excellence or defect which it has in common with a class. In other words, we apply to it the concepts which generalization alone can furnish. We reflect on the actual attainments and doings of this individual *ego*, in order to judge of the class of beings to which to assign it, that we may know its worth and its destiny. We devise methods to improve it in the light of certain generalized concepts. In ethics, we recognize both the individual *ego* of the natural consciousness, and the generalized *ego* of reflection.

We can also go beneath the generalizations of self that are founded on what consciousness observes and records. We can conceive of the soul as capable of other functions which connect it with the living body, and fit it to act in another sphere and under other relations. In these researches we depart still further from the sphere of the natural consciousness.

Coleridge eloquently says: "There is a philosophic consciousness which lies beneath, or (as it were) behind the spontaneous consciousness natural to all reflecting beings. As the elder Romans distinguished their northern provinces into Cis-Alpine and Trans-Alpine, so may we divide all the objects of human knowledge into those on this side, and those on that side of the spontaneous consciousness. * * * The first range of hills that encircles the scanty vale of human life, is the horizon for the majority of its inhabitants. On its ridges the common sun is born and departs. From them the stars rise, and touching them they vanish. By the many, even this range, the natural limit and bulwark of the vale, is but imperfectly known. Its higher ascents are too often hidden by mists and clouds from uncultivated swamps, which few have courage or curiosity to penetrate. To the uncultivated below, these vapors appear, now as the dark haunts of terrific agents, on which none may intrude with impunity; and now, all aglow with colors not their own, they are gazed at as the splendid palaces of happiness and power. But in all ages, there have been a few who, measuring and sounding the rivers of the vale at the feet of the further inaccessible falls, have learned that the sources must be far higher and inward—a few who, even in the level streams, have detected elements which neither the vale itself, nor the surrounding mountains could supply."—*Biog. Lit.*, Chap. 12. This passage is more eloquent than just. So far as it describes the remoteness of the philosophic from the spontaneous consciousness, it is striking and true. So far as it fails to recognize the near relation of the two, and the responsibility of the one to the other, it not only fails altogether, but suggests the mischievous inference, that the philosopher discovers truths and relations which are in no sense whatever known by

the common consciousness—an inference which would invest the philosopher with a magical gift and authority, as well as release him from the obligation and the means of proving and teaching what he discovers, to any but the initiated few.

§ 97. The relations of the natural to the philosophic consciousness cannot be fully appreciated, unless we advert to the office of language with respect to each. Language is of essential aid in giving precision and permanence to the observations and results of the reflective consciousness. It is an indispensable requisite to man in every species of scientific research, but in none is it so eminently serviceable, as in the scientific observation of the soul. The subject-matter, as we have seen, is fleeting. It endures but for an instant. The state which we observe and record no sooner appears, than it is gone. If we recall another like it, we must depend on the distinctness with which we reproduced the original observation, to justify us in using it for the purposes of science. The matter is not fixed and abiding by which we would test our theories and detect our errors. But we can give it outward form and definite shape by embodying it in words and expressing it in speech.

The frequent use of the word, makes familiar the state and its discerned relations, of which it is both the symbol and the record. To enshrine a refined observation or a subtle distinction in a fit epithet or a well-chosen name, enables us to revive the conception when the mind is less wakeful, or summons us to search for it where it would not spontaneously present itself. The thought, however evanescent, is held before the mind for the purposes of comparison and philosophy, when the word is often sounded to the ear or pictured before the eye. By the sharply-cut outlines of language, thought-objects are so presented that we can avoid a crowded, feeble, or bewildered gaze, when we would summon our energies to compare, classify, and explain.

But language does not create phenomena and furnish observations. It simply records both, and directs and stimulates others to repeat like efforts of thought for themselves. To attempt to observe without it, is to reject the aid which nature furnishes to our hand, and to the use of which she prompts us, by an impulse which we cannot resist if we would. But we should ever remember that language is only an aid, and that the ready use of it by ourselves or others cannot release us from the obligation to think and observe for ourselves, to consider attentively and reflectively judge the states of our own souls, to reproduce and study which, the words of others simply direct and aid us.

We ought especially to guard ourselves against the liability to be imposed on by the use of a refined and technical terminology, or the exhibition of a well-rounded and carefully-adjusted system. Both these features are of themselves essential requisites in any science, and in none more than in the science of the soul. But they exhibit only the relations of psychological facts as viewed by this or that philosopher, and do not necessarily assure us that they exhibit all the facts in their just relations, that none are overlooked and nothing is invented. Technical language is essential to the use of the reflective consciousness, but it is not nearly so certain to exhibit the facts

Office of language in respect to each.

Language does not create the facts.

Dangers of mere technology and system.

just as they are, with the beliefs and relations which they involve, as the language of the natural consciousness or the language of common life.

The language of common life sometimes the safest.

Indeed, as an expression of psychological facts and a touchstone of psychological theories, the language of common life is far more worthy to be trusted than the language of the schools. It is the outspokening of those beliefs and feelings, those distinctions and likenesses, which man is naturally conscious of, and which he therefore spontaneously expresses. It is the unconstrained embodiment of all that happens to his inner self; the subtle robe which the spirit is continually weaving for itself in all its inner processes. Each fold and adjustment is a natural and necessary product. Not one is assumed for a purpose. It is free from all those biasing influences which spring up on the soil and within the limits of speculation, from the influences of preconceived theories, whether fondly cherished by their originator, or traditionally accepted from revered teachers; whether adopted or defended through the pride of opinion, the tenacity of consistency, or the heat of controversy. It is expressed in too great a variety of forms, and under circumstances too much unlike, to admit the supposition of any common prejudice or common interest. We are forced to accept the common discourse of men as expressing the unbiassed convictions of those who are competent to discern and decide upon the truth.

How much do uncultivated men know?

But are uncultivated men competent to understand and decide upon such truths as are in question among philosophers? Let it be granted that their language expresses their judgments, and that these judgments are worthy to be trusted as far as they go. But do they reach the questions and distinctions of the schools? Can common men understand these questions and distinctions? and if they cannot understand their import, how can they decide upon their validity or their truth? These inquiries are often urged in the way of exception and reply, to the view of the language of common life that has been expressed. The answer is brief, and it ought, as it seems to us, to be decisive. The facts which the philosopher seeks to discover are the facts or phenomena which are common to all men, and of which all men are actually conscious. They are not the phenomena which are experienced exclusively by philosophers, whether in the form of knowledge or of feeling, but those which are as extensive as the experience of the human race. What all men experience when they know or feel, they will be likely to express in language; for they cannot know or feel, without knowing that they know and feel. So far, then, as they attend to these processes, and express in language what they discern, they are likely to express the real facts which consciousness discerns; and these are the very facts which the philosopher desires to know. They will not use the language of the schools, for this is to them a strange tongue. They will not even understand this language—they will not be able even to recognize their own thoughts and their own beliefs when translated into this language; but they experience all the phenomena which the philosopher compares, classifies, and interprets, and then expresses in terms that are technical and scholastic. In philosophizing upon these facts the philosopher is liable to serious mistakes in respect to the facts themselves, and their essential elements.

The language of common life unsafe.

To detect and correct all mistakes of philosophy, the unbiassed and unreflecting language of common life is often one of the most efficient instrumentalities. The questions

are often grave and difficult. What are the original or elementary facts of human experience? What would analysis show to be the real and the ultimate elements in our knowing and feeling? To answer questions like these, there is no readier and surer expedient than to ask, How do men express themselves all the world over, when they have no theory to maintain and no point to carry? What are the unthinking utterances of common men? Language is thought made visible. But thought is belief that something is true. The language of common life is, then, the beliefs of unbiassed men made visible, concerning points in regard to which we simply desire to ascertain what their unbiassed consciousness discerns to be true.

The actions of men also an important test of truth.

§ 98. The actions of men are also of great importance in ascertaining what are the real beliefs of men. Their actions speak louder than their words. When the actions of men can only be explained on the supposition that they are conscious of certain knowledges, or believe certain facts which they may deny in their philosophical speculations, or do not provide for in their psychology, we conclude that their philosophy is defective or wrong. We appeal from the propositions and reasonings of the reflective consciousness, to those actual beliefs of the natural consciousness which their actions demonstrate that they hold. When men act persistently and habitually as if they believed certain facts were true, we cannot doubt that they do believe them, however they may seek to persuade themselves or others to the contrary. But in the study of the soul it is always an important problem to ascertain what are the elementary and original beliefs of which men are conscious. When these are ascertained by their habitual language and conduct, it is with great confidence that we proceed to examine the principles which their philosophy assumes, as well as the conclusions which they derive from them

These thoughts suggest the truth, which ought ever to be kept in mind and applied, that the teacher of psychology must appeal for the truth of his assertions to the consciousness of the learner. He can communicate nothing upon authority. His duty is to ascertain and classify and interpret the phenomena of his own soul, and to set forth the processes and the results in a manner so clear and so self-evidencing that his pupils will be enabled to consult their own consciousness as he proceeds, and to find in it a confirmation of all which he propounds. Whatever is asserted by the teacher or guide, should be constantly met with the inquiry, Is this confirmed by my experience, or rendered probable by the analogous facts which ~~the~~ experience furnishes? The testimony of others, and the authority of their opinions, should influence us greatly, not to change our opinions against the evidence of consciousness, but to revise these opinions with care, and often to suspect the exactness or the candour of our own observations, whenever the weight of authority is against our own convictions. But in psychology, pure authority has no weight against the final decision of consciousness itself.

Conditions of reaching the decisions of consciousness.

§ 99. To reach this decision, two conditions are necessary: *First*, that we fully understand the questions which we are to decide, in all their import and in all the relations which

they involve ; and *second*, that we patiently and candidly use all the appliances and tests which are at hand to determine the answer. The greatest practical difficulty in settling questions in psychology arises from the circumstance that we do not, first and foremost, make ourselves fully and familiarly acquainted with the questions which are to be decided. We too often assume that we fully understand what we have only imperfectly mastered. Or if we apprehend the point in question for a moment, we fail to make it so familiar to our thoughts as is necessary in order to view it at all times in all its relations, and to decide with a full and distinct appreciation of the entire import of all which it involves. Men are reluctant to bestow this preliminary reflection, because they think that they are already fully acquainted with the question in discussion, and the terms and distinctions involved.

All men know something about their own souls, and are able to pronounce with confidence upon many questions that are in controversy. They hastily conclude that they understand every question as soon as it is propounded, and are often in haste to decide, before they have fairly ascertained what the question is. Hence the misunderstandings and disputes between men who are apparently in earnest to discover the truth ; hence the warmth with which each disputant maintains his opinion, and the obstinacy with which he defends it against attack. Each man is quite certain that what he has in mind is true ; but is he equally sure that his antagonist and himself have the same thing in mind ? or that either has all and no more in mind than is properly understood by the terms ? All men know something about psychology, therefore many men decide upon any question which comes before them before they have been careful to learn what the question is. All men are theologians and metaphysicians by nature ; therefore they conclude that there is no question in theology or philosophy which they are not at once competent to decide. They pronounce upon a problem before they are fully possessed of the terms, the data, or the means of solving it. The very energy with which they attend to some phenomena, and the blind impetuosity with which these facts drive them to a conclusion, render it impossible that they should attend to all the facts. The exemplariness, with which they comply with one of the conditions of successful reflection—viz., that they attend—confirms them in the belief that they have complied with the second, viz., that they attend to *all* the phenomena. They do not suspect that they have failed in the second, through the earnestness with which they obey the first !

Uncertainty and slow progress of psychology explained.

§ 100. These considerations explain in part the apparent paradox or contradiction in terms which is presented in the claim, on the one side, that the facts of consciousness are the most certain of all facts, and in the notorious fact, on the other, that many of the simplest and most fundamental principles in psychology are yet undecided, while its philosophical theories are the endless themes for never settled controversy.

The claim is a just one. The facts of consciousness are the most certain of all facts. The objects which consciousness presents are, if possible, more real and better attested than the objects of sense. We can question whether the eye and the ear do not deceive us ; whether the sights which we see and the sounds which we hear are not illusions. We ask, at

times, whether this entire sensible world is not a succession of shifting phantasmagoria; but we cannot doubt whether we perform the acts of seeing and hearing. We may question whether these objects are what they seem to be, but not whether certain acts are in reality performed. We may doubt whether this or that object be a reality or a phantasm, but we cannot doubt that we doubt. Nothing in the universe is so certain, and deserves so well to be trusted, as the psychical phenomena of which each man is conscious.

On the other hand, the fact adduced in objection cannot be disputed. Psychology is unsettled, and every treatise which professes to give the facts of the soul in scientific form and relations, abounds in criticisms of theories that are still adhered to, and in controversy against opinions that are maintained by eminent writers. How can this fact be reconciled with the claims to superior clearness and certainty that are asserted for the facts of consciousness?

The positions which we have laid down in respect to the relations of the natural to the reflective consciousness, enable us to reconcile this apparent inconsistency. First of all it is to be noticed, that there is as much vagueness and dispute in respect to the less obvious conceptions and relations of material objects, as in respect to the more recondite relations of psychical phenomena. The obvious facts and relations of matter are accepted without controversy, and are described in popular language. Those which are less obvious, or which involve nice observation, careful discrimination, or some speculative assumption, are quite as much in controversy as are the obvious phenomena of the soul when subjected to philosophical elaboration. The metaphysics of mathematics, of physics, of chemistry, are as much in doubt and controversy as are the metaphysics of psychical facts. It is because psychology always resolves itself into metaphysics, that psychology always rushes into controversy.

Moreover, it not only concerns itself with its own metaphysics—those which are appropriate to its own facts—but it shoulders the metaphysics of all the material sciences, and transfers to its own arena the smoke and dust that properly belong to the doubtful questions on other fields, and therefore incurs the special reproach to which we have alluded. One reason why psychology is always vague and unsettled, is that it attempts more than do the physical sciences, going more deeply than they into the philosophy of its appropriate facts. Another reason is, that the reflective consciousness always aims to give the philosophical relations and explanations and definitions of psychical facts. Indeed, the language of common life does to a certain extent embody a philosophy, as well as utter the beliefs of the natural consciousness. When, then, it is asserted that the facts of spiritual experience are better worthy to be trusted than the facts of sense and of matter, it is only claimed, that what is experienced, as experienced, is worthy of confidence, and actually secures it; not that, when it is expressed in language, especially in the language of the schools, it is placed on higher grounds of certainty. It is what we experience in the natural consciousness, not what is philosophized upon in the reflective consciousness, that deserves and receives such implicit trust. We grant that it is not so easy to shape our philosophy by our facts, nor to test our philosophy by our facts, in the psychical as in the physical sciences. This leads us to observe that:

Peculiar difficulties in the study of the soul.

§ 101. The peculiar difficulties which the student of psychology must expect to encounter will be suggested by the analysis which we have given of the two sorts of consciousness.

They are the following :

First : The objects of contemplation are not, as in the material world, permanent objects, to which the mind can come and go, so as to bestow repeated observations, till every feature and relation has been carefully and minutely examined. In the science of the soul, the objects—i. e., the phenomena—cease to be, while consciousness surveys them. Material objects become more vivid and distinct the more keenly the attention is fixed upon them ; but the objects of consciousness are consumed by the concentrated gaze of reflection which would master the secrets of their being. The repeated creation of a similar object for the second application of consciousness is the only substitute for the continued examination of the same object.

Second : Two observers, and, if need be, twenty, or twenty thousand, can examine and re-examine the same material object. But the objects of the soul can be surveyed by a single observer for a single instant only. If many observers agree to examine in order to analyze what they conceive to be the same object, it is sometimes difficult for them to be entirely sure that the objects before their minds are actually the same.

Third : The testimony or report which one observer brings of his examination, cannot avail as a substitute for personal inspection by the student himself. Should he even confide entirely in the competence and the candor of another party, he needs to observe for himself in order to be sure of the identity of the object concerning which he accepts the testimony of another.

Fourth : Objects of sense are clearly distinguished from and set over against the soul that observes them. In the very act of observation the soul separates them from itself. Objects of the soul are known not to be severed in fact from the soul which observes. For the soul attentively to view its own states as objects to itself, there is required a special and constrained effort. "The understanding," says Locke, "like the eye, while it makes us see and perceive all other things, takes no notice of itself ; and it requires art and pains to set it at a distance, and make it its own object."

Fifth : The act of reflection, or second-thinking, for the sole purpose of examining the nature of the act or state already experienced, is especially artificial, and against nature, for the reason that men usually act for some direct object of use, enjoyment, or duty, and, in thus acting, their look must necessarily be outward and objective. It is necessary, if men would act with interest and energy, that their feelings be strongly aroused by the object itself. But to reproduce the act a second time, or its pale reflection, for the sole purpose of seeing of what sort or nature it is, is not

natural, because most men are not greatly interested to know thoroughly and scientifically what their actions are. Or, if they are interested in this as an end, yet the reproduction, and the continuation through successive reproductions of an act or state, for the mere object of examining its nature, is embarrassed by the difficulty of reproducing it without the excitement of its appropriate object. We perceive, remember, and imagine, hope and fear, choose and reject, naturally and readily enough, when the objects arouse and excite us; but to perceive and re-perceive, to hope and fear again and again, simply that we may know more exactly how it seems or what it is to perform or experience these states, are, at best, forced and unnatural efforts. Nothing but the deepest convictions of the dignity and value of the results in the acquisition of intellectual discipline and the advancement of psychological science, can impel to the earnest undertaking of such efforts, and the patient prosecution of them to a successful issue.

Sixth: The objects of matter invite to analysis by their obtrusive likenesses and differences. The phenomena of the soul do not present such obvious occasions for analysis. Material objects do, as it were, indicate by dividing lines, by intersecting seams, by salient and projecting points, the sections into which the object falls apart under the eye of analysis. Indeed, Nature herself is continually separating and combining these objects before our eyes, changing color and form, disintegrating and throwing apart the diverse materials which are aggregated into masses by mechanical attraction; as when the frost breaks up and rolls out the different ingredients of a rock; or decomposes the ingredients chemically united, as when, in fermentation or by heat or solvents, gases and precipitates betray their presence to the senses. The so-called five senses can no sooner be applied together or in succession to any object, than they begin at once to suggest five sets of qualities or attributes, to say nothing of new relations of extension and of number.

To the analysis of the phenomena of the soul there are no such forward promptings of nature. A psychical state, when viewed by consciousness, does not suggest diverse attributes or relations. To bring these to light, it must be brought into comparison with states like and unlike itself. These must be recalled by memory, and vividly reproduced to the imagination. One state must be artificially confronted with another, for the sake of evolving some common points of likeness or contrast.

All these circumstances combined explain the inherent difficulties of philosophical self observation, and the slow progress and the uncertain conquests of the science of the soul in contrast with the rapid advances and the certain results of the science of matter. The history of psychology is not, however, without gratifying attestations that its progress, though slow is real, and that its acquisitions, though often disputed, are more and more assured.

CHAPTER III.

SENSE-PERCEPTION : THE CONDITIONS AND THE PROCESS.

From consciousness, as the first faculty or form of presentative knowledge, which is concerned with the objects of spirit and their relations, we proceed to the second, which is concerned with the objects and relations of matter. We define

§ 102. Sense-perception as that power of the intellect by which it gains the knowledge of material objects. It is also called sensible perception, or simply, perception. We apply these terms to the power, the act, and even to the object. Thus we say, Man is endowed with perception; *i. e.*, with the power to perceive. We say, My perception of the color or sound was clear and vivid—describing the act of perceiving. We also ask, Do you recall certain perceptions, as of color or form?—emphasizing the object.

The terms *to perceive* and *perception*, are applied freely to other acts and objects of knowledge besides those which require the agency of the senses. We are said to perceive, and to have perceptions of mathematical distinctions, of the drift and force of reasoning, of the design of a machine, and of the purpose of an antagonist. But perception, in the technical and limited sense of the term, is appropriated to the knowledge of material objects, and of the external world. This knowledge is gained or acquired by means of the senses, and hence, to be more exact, we call it *sensible perception*, or, more briefly, *sense-perception*.

§ 103. Sense-perception is called into activity first of all the powers of the intellect. It is educated and fully developed in our earliest years, at a period and by processes which we cannot distinctly recall to memory. Its objects occupy the almost exclusive attention of the great majority of men, and excite their most absorbing interest and their strongest passions. It is also the essential condition and attendant of their higher knowledge and beliefs. For all these and other reasons, it naturally receives the earliest attention in the study of the intellectual powers.

The processes of sense-perception seem to most men to be the most familiar and the best understood of all their intellectual acts. They introduce them to those sensible and material objects which are generally believed to be the most real of all existences. They minister pleasures and pains, and excite passions which take the strongest hold of man's nature. Their activity is more constant, unremitted, and energetic than is that of any other function. So long as man continues to exist in the present form and conditions of his being, he never ceases to perceive. Some of the senses are all the while in action. Sense-perceptions are present in his loftiest speculations and his most refined reasonings. They often force themselves upon the reluctant attention. The world of sense holds man to its realities in the most ethereal of

his flights, and never ceases to be the dark or radiant background to the brightest pictures of his fancy. Sensations visit man in sleep. They disturb or soothe his repose. They haunt him in his very dreams. With sensations and sense-perceptions man begins and ends his earthly existence.

§ 104. But though this power is developed so early and exercised so constantly, and, at first view, seems so easy to be understood; it is far from easy to analyze its elements, or to explain its processes. To understand sense-perception, we must study the body as well as the mind; we must trace out, and, as it were, unwind the subtle connections by which the two are united; we must show how far the one is dependent on the other; what each furnishes toward the result, and what are the separable acts or processes in which the action of each may be distinguished.

In point of fact, the power of sense-perception has received a greater share of attention in the science of the soul than all the other powers and faculties united. This can be accounted for, because it would naturally first attract the attention, seeming to be the easiest to be understood because the most familiar. Being found to be difficult of analysis and explanation, it would detain and hold the attention, because the mind was puzzled and disturbed by these unexpected difficulties. Its phenomena are dependent on material conditions, and physical or material explanations would be readily suggested to account for them. These are readily resorted to in the infancy of psychology.

For all these reasons we can understand how it has happened that theories of perception have occasioned more speculation and more controversy than theories on every other subject in psychological science. Not only have they misled men in respect to their proper subject-matter, but they have led to incorrect conceptions of the soul itself, and to erroneous views of all the other powers. Many of them have involved materialistic assumptions, or have logically required the grossest materialism as their necessary consequent. Such inferences have been actually accepted by many as the result of a false or inadequate theory of sense-perception.

§ 105. The first requisite to a correct theory of perception is to separate the act from every other with which it is likely to be confounded. As the power gives us knowledge of material objects, it is not unnatural to suppose or hastily to conclude that much, if not all the knowledge which we have of matter, is gained by this process alone. A more careful examination shows that we gain very much of our knowledge of these objects by the exercise of the other and higher intellectual powers. This examination can be conducted most successfully by taking a single example of some well-known object, and inquiring how great a share of our knowledge of it we do, and how great we do *not* gain by sense-perception.

We select an orange, and inquire first what acts of knowledge in respect to it are not acts of perception; and second, what knowledge is properly ascribed to this power as its proper origin and source. We shall then be prepared to consider how this power can be defined, and what are the elements into which it can be resolved.

We first look at the orange, and immediately supply the half which we do not see—the

Is not the most easily understood

Distinguished from other mental acts.

Knowledge of matter not gained by sense-perception.

portion of the sphere which is hidden. We know, or believe, the orange to be spherical. The part which we supply we do not perceive by the eye of the body; we only image it to the 'mind's eye.' If we close the eyes, we can with the eye of the mind picture and discern the yellow orange; but the orange which we know in this way we do not perceive. We may imagine the color to be changed, and make it green, or blue, to the mental vision. We can change its form even, and make it elliptical; we can enlarge or contract its dimensions, without changing its form. All these are acts of *imagination* or *representation*, but not acts of perception.

We can separate its form, as spherical, from all material reality, and can construct the abstract or mathematical sphere for the mind to consider and analyze. We can reflect on its properties and its relations to the circle by the revolution of which it is conceived to be produced. The discernment of the mathematical forms, properties, and relations which may be applied to the orange is not perception.

We know, or believe, that the orange has sensible qualities, as of taste, color, feeling, smell, and that all these are inherent in or belong to the something which we call their substance. The knowledge of the orange as substance and qualities is not necessarily involved in perception.

We observe that other objects possess qualities like some of those which belong to the orange—that some are yellow, others are round, etc.—and are therefore properly classed with it and receive a common appellation. But classification and naming are not perception.

We can know that this fruit has been produced by the powers and under the laws which are appropriate to vegetable life; or, in other words, that it is an effect of certain agencies which we can satisfactorily determine. Knowledge of this sort is not essential to perception.

We can know, by reasoning, that it will produce certain effects if eaten, or used in illness; but this we do not know by simple perception.

We can go still further, and know, or certainly believe, that it is adapted to and was designed for certain uses or ends; that it exists or was produced with reference to these ends—as to minister comfort and afford nutriment to man. The knowledge of designs and uses is not necessarily present in the simplest forms of perception.

It is evident that all these acts of knowledge may be performed upon or with respect to the orange, and that none of them are simply acts of sense-perception. It is equally clear that there are other acts which are the prerequisites to these; so that, if we did not know something more of the orange than we acquire in these ways, we could never know the orange by these higher methods. This preliminary knowledge remains to be considered, after these higher processes are set aside.

What are acts of sense-perception?

Knowledge that is gained by sense-perception.

§ 106. What is this preliminary knowledge, and what the processes by which it is gained? We answer at once, It is the knowledge which is necessarily involved in the use of the organs of sense, or of the senses.

Let us try the senses upon the orange, one by one; and first the sense of smell, suspending the action of every other. We perceive a grateful odor, and that is all we know of the orange by this means. Should or could we remain in this supposed condition, this is all that we should ever know of it.

We open the ear, and the orange falls, or is struck. We hear the sound from the fall, or the stroke, and this is all that we know by the ear.

We taste the orange. At once two kinds of knowledge are given, as two senses awake to action—the senses of taste and of touch. For the tongue is as truly an organ of touch as it is of taste. But if we could separate the touch from the taste, we should perceive the flavor only.

We grasp it with the hand, first lightly, so as only to be aware of its presence, then with greater force of pressure, so as to encounter resistance. We pass the hand over the surface, and perceive that it is smooth or rough. We come to its limits; for the hand is in contact with another something. This object can be separated from the orange. It can by the hand be brought near or removed from it. Through the hand we can perceive the object as impinging and resisting, as smooth or rough, as having extension and form.

Last of all, we open the eye. A surface of color presents itself, separated from other shaded and colored surfaces by an encircling ring. The color is shaded by the most delicate transitions, deepening here, almost vanishing there. As the orange is near or remote, the limiting or bounding circle widens or is contracted, and the colors are feeble or bright. The eye gives colored extension, form, motion, and relative size. Were we all eye, we should perceive nothing more.

In connection with the use of these organs, we perceive or are aware of certain changing affections that attend upon the varying condition of the muscles that direct and move the sense-organs. We know the muscles as tense and as relaxed. We apprehend the affection that belongs to the grasp that is firm and that which is relaxed; the feeling that attends the stretching forth and the withdrawalment of the hand. Certain vital and muscular affections are known in connection with the sense-perceptions.

These various knowledges, or *percepts*, obtained by these several means, we combine into one separate and single object, occupying a limited portion of space. The process of perception is not complete till we have attained the knowledge of single objects, made up by the mind of separate parts corresponding to the several senses, and having definite relations of form and magnitude. Such an object we call a material thing. When we have gained such a knowledge of the object as enables us to recall and otherwise use it as a mental representation or object, we have completed all that is essential to the process. In other words, we perceive objects when we can retain and revive representations or images of them as separate things or wholes.

Much of our knowledge of sense-objects is acquired indirectly. We make the knowledge received by one sense a substitute for that which we might receive by another. Thus, by the color of the orange we know its taste; by its appearance to the eye, its feeling to the hand—whether it is hard or soft, whether it is green or ripe. We know an object to be near, by the distinctness or sharpness of its outline and the vividness of its color. We know it is remote by the dimness of the line and the dulness of the color. We determine its distance by its size, and its size by its distance. Knowledge obtained by such processes is called *acquired perception*. The knowledge of sense-objects under the relations of substance

and qualities involves the application of still higher relations and powers of the intellect.

§ 107. This general outline or preliminary analysis of sense-perception has shown that it is dependent on corporeal organs or instruments; that it is attended by special sensations, each differing in quality and intensity according to the constitution and condition of its appropriate organ; that in connection with each of these sensations we gain a positive knowledge of material objects; that we unite these knowledges, so as to gain and retain perceptions of separate material things, and that we gain this knowledge of things both by direct observation and indirect inference. It also opens for us the following distinct topics of inquiry:

I. *The conditions or media of Sense-Perception.*—II. *The process of Sense-Perception, in its two elements of Sensation and Perception.*—III. *The classes of Sense-Perceptions.*—IV. *The acquired Sense-Perceptions.*—V. *The development and growth of Sense-Perception.*—VI. *The products of Sense-Perception.*—VII. *Activity of the Soul in Sense-Perception.*—VIII. *Theories of Sense-Perception.*

I. *The conditions or media of sense-perception.*

§ 108. We perceive by means of certain bodily organs, and on the condition that these organs are excited by their appropriate objects or *stimuli*, and that the nervous system with which these organs are connected, shares in this excitation. These conditions of sense-perception are purely physiological, and are discovered by the senses. The first condition is the existence of a material, nervous, and sensorial organism.

To understand the structure and office of the organs of sense-perception, and their relation to psychical experience and activities, we must consider some general facts in the structure of the body of which these organs are a part.

The human body is material in its composition; i. e., it consists of particles of matter which are endowed with the properties, and subject to the laws which belong to matter in general. Its skeleton is a framework of bones, the parts of which, like those of any other framework, can be broken into fragments by a blow or a fall. These are fitted together with obvious mechanical ingenuity, and are firmly held in their places by strong and well-banded ligaments. This framework is so shaped and adjusted as to serve as the support of the muscles, which both hold the parts together and wall in the principal cavities. They also originate and convey motion—the motions of the several parts, and of the whole, according to mechanical laws. The several cavities of the trunk contain special organs, which, with their connected tubes, digest the food, assimilate the nutriment, circulate the blood and other fluids, and aerate the blood through the expanding lungs by contact with the oxygen of the atmosphere. These parts, with the nervous system, constitute an organism, or organic whole. Such an organism differs from a machine, in that each of its separate material parts performs certain functions, as digestion, secretion, circulation, respiration, each of which is peculiar, and appropriate to no other organ. This function is essential to the existence and

action of every other organ, and to the performance of its special function; while all must act together in order to further or render possible the special action of each. The united action of the whole is essential to the separate action of each part; and the separate action of each part is essential to the united action of the whole. If digestion is weakened or arrested, the blood ceases to move and the lungs to expand, or both these functions are irregularly and imperfectly performed. Death may ensue. That which showed itself to be alive, by the performance of all these functions, now shows itself to be dead by performing them no more. The matter of which it was composed is given over to those agents of decomposition which they before resisted, and the particles themselves are disintegrated, and fall asunder. The once living organism is now dead matter.

The nervous system. In this living organism is present a system of organs, consisting of the brain, the ganglia, and the nerves. The nerves are filaments which terminate on every surface and at every extremity of the body, and penetrate every portion, even the very bones. They are interlaced with one another, and are occasionally expanded into large knots or masses of their substance. These expansions are called ganglia, and serve as independent centres of nervous activity and force. The nerves increase in size as they approach the ganglia, the spinal marrow, and the brain. By means of the ganglia and the spinal marrow, they are all connected with the brain, which is itself a larger ganglion, or system of ganglia—a large convoluted mass made up of the same two species of matter of which the whole nervous system consists. This system of nerves performs several distinct functions, all important to the life and well-being of the body. If some or all of the nerves are diseased, single organs fail, or the entire body perishes. If the spinal marrow is injured by disease or violence, the limbs are wholly or in part disabled. If the brain is shocked by concussion, life is suspended, or returns no more.

The sensorium. The function of the nervous system with which we are specially concerned, relates to sensation. To fit the nerves for this function, they are connected with various organs, the most noticeable of which are the eye, the ear, the nostril, the hand. These are framed with special adaptation to their appropriate objects, and suffer certain changes or impressions from these objects, all of which are necessary to the sense-perception. These organs, with the nerves attached, as capable of the sentient functions in an animated or living organism, are known by the collective term, the *sensorium*, or *sensory*. The term is technical, and is appropriate to those organs and nerves, and only those, which bear some part in the process of perception, and so far only as their function relates to this process.

The reflex action of the nerves. We must notice another function of the nervous system which is intimately connected with perception, viz., their capacity for reflex action. The nervous filaments which proceed from the external and other organs run side by side in pairs, two being united within the same covering or sheath, and connected by interwoven fibres. If any part where they terminate is irritated, or excited

in any way, one of these filaments conveys the notice to the brain or ganglion, and the other conveys the stimulus back to the place where the impression or sensation occurred. We say the impression or sensation, for it is by no means essential that the soul should feel pleasure or pain, or in any way be aware of the occurrence. Whatever the excitement may be, the companion nerve responds to the call of its associate, and contracts, convulses, or moves appropriately the muscle or the organ which is aroused. A message of invitation or warning flashes inward along one of these mysterious filaments, the *afferent*. An answer is sent at once outward by the *efferent* to the place from which it came, and the answer is obeyed. This may be done without the intervention or the knowledge of the soul. The nerves arranged for this special service of the senses and of motion are called the *sensu-motor*, and the general action which we have described is called their *reflex action*.

The nerves, it will be observed, are the subjects of diverse affections or phenomena. First, they are subject to mechanical action and change. Like other filaments, they can be bruised, rent, or cut. Second, their constituent elements suffer chemical changes. Third, they minister to the healthy or unhealthy action of all the vital and sense-organs. Fourth, they are capable of various reflex actions, both occasional in response to casual excitements, and regular, as in sustaining the involuntary action of the heart, lungs, and other organs. Fifth, last of all, when a sentient soul makes this organism living, they are capable of a special affection or excitement, which is the condition of sensation and sense-perception. The first and essential requisite to sense-perception is the existence of the sensorium as thus defined.

§ 109. The second requisite to sense-perception is the existence and the presence of appropriate objects. We say in general, there must be visible objects in order to vision: audible objects in order to hearing: tangible objects in order to touch. In other language we say, objects, to be perceived, must be luminous, sonorous, resisting; or, more abstractly, there must be *light*, *sound*, and *hardness*, or there cannot be *vision*, *hearing*, or *touch*.

One apparent exception to this principle occurs in the case of the so-called subjective sensations which are excited by stimulating the nerves by peculiar agents. Thus the optic nerve, under electrical applications, may be so excited as to occasion flashes of light. Sparks are perceived, from a blow or contusion. Slight sensations of smell and of taste, also a ringing or whizzing in the ears, are occasioned by electrical action. Experiments of this kind prove that the sensation depends entirely on the excitement of a part of the sensory to a given species of activity, and that this excitement is idiopathic, or limited to the nerve or nerves concerned; e. g., the optic nerve alone emits light; the acoustic nerve, sound, etc., etc. Physical researches into the nature of the objects of sense-perception have convinced many philosophers that their action upon, or their power to affect the sensorium depends on the motion of the particles of matter. In the view of such, all objects which are perceived are capable of a more or less frequent motion; and according to its greater or less rapidity, when

It properly affects the nervous organism, is the sense-perception in its quality and intensity. Thus light, as perceived, is resolved into undulating ether, and according as its undulations are more or less rapid, so the object seen is scarlet, violet, red, or yellow. Sound is also dependent on similar vibrations. So, as is presumed by analogy, is it with smell, taste, and touch. Similar conclusions are accepted with respect to heat, and the various forms of pleasurable or painful muscular and subjective experiences, as of bruising, tearing, etc., etc. This analysis, with its results, is simply physical. It proves only in what condition matter is or must be, in order to be perceived. Its inquiries respect only the physical conditions of the sense-perceptions. They shed no light at all upon the experiences of the soul. What the soul experiences and apprehends are not motions of any kind, but different sounds, tastes, smells, colors. As physical researches, these inquiries are legitimate and attractive. But to psychology they have no application, because they stand in no rational connection with the phenomena to be explained. Cf. H. Lotze, *Mikrokosmos*, vol. ii. B. V. c. 2.

The third condition. Its action on the sensorium.

§ 110. The third condition of sense-perception is the action of the object upon the sensorium. In order to receive this action, the external organs must be in a normal condition—viz.

the eye, the ear, the palate, and the skin. If any lesion or disease occurs, the perception is irregular or impossible. In like manner, if the nerves are diseased or destroyed, the perceptions are disturbed or prevented. Let the optic nerve be injured, and the vision is doubled, clouded, or extinguished. So is it with hearing, with touch, with smell, and with taste.

It is contended by many (L. George, *Die fünf Sinne*, Berlin, 1846; J. D. Morell, *Outlines*, etc., Lond., 1862), that the excitement of the sensorium to the condition favorable to sense-perception is simply the arousing of its nerve substance to vibratory action or motion. Strong confirmation of this view is derived from the kindred doctrine that the objects of perception are matter in different modes and rates of motion. As the researches and speculations in respect to matter are purely physical, so this inquiry and its results are exclusively physiological. They relate only to the conditions, but furnish no explanation of the psychical phenomena as experiences or acts of the soul. As the soul does not perceive undulating matter in light and sound, no more does it perceive the vibrating nerves which proceed from the eye and the ear. Psychologically—i. e., in its conscious experience—it knows nothing of these objective or subjective conditions, either as physical or nervous requisites to its own states. In its conscious states it feels and perceives, and it is conscious that it feels and perceives. What takes place in the matter without, or in the organ with which the matter comes in contact, or in the nerve itself which proceeds from the organ, it can only view as a physical or physiological condition to a psychical fact.

How, then, it may be asked, do we know that these three requisites must be present? We reply, Only indirectly. We learn it by inference. If the sensorium no longer exists, there is no perception. If the object is withdrawn, as the luminous or sonorous matter, there can be no perception. Perhaps it may be proved that, if the matter does not vibrate, the result is similar. If the organ or the nerve is destroyed, the soul does not perceive. We conclude that all these are its essential conditions. But that they are not the acts or states themselves, will be still more manifest from the consideration of the act of sense-perception itself. We proceed next to:

II. The process of sense-perception.

The process of sense-perception in the simplest form; what?

§ 111. The simplest form in which sense-perception is experienced is in connection with a single organ of sense. The states or acts which we ordinarily call sense-perceptions, by

which we apprehend the most familiar objects, as a table, a chair, a horse, or a dog, are made up of too many elements to allow us to discern the precise character of the elements or the steps of the process itself. It is only when we consider a single act, as of seeing and hearing, and of the simplest object, as a single color or sound, that we are in a condition to determine what are the essential nature and elements of the act itself.

It is psychical, not physiological. The most general answer which we make to our inquiry is, that it is clearly and distinctively a psychical and not a physiological phenomenon. We are prepared, by our previous analysis, to distinguish perception from the organic instruments and conditions that are essential to it. Neither the eye nor the optic nerve, nor the image formed on the retina, nor the nervous response to the image—none of these, nor all of them together, constitute vision. The picture may be formed, the nerve may be stimulated to reflex activity, so as to contract the iris or let fall the eyelid, and yet there may be no sight. If a hot iron is applied to the flesh, and the soul does not feel and apprehend, there is no sense-perception. It may disorganize and destroy the flesh, consuming it to the bone, and yet, if the soul does not respond, the phenomenon which we seek for does not occur. In order to this, another element must be furnished, and a new energy must be aroused from the soul itself. Its presence and its nature are known by consciousness. Its physical conditions are observed by the senses and traced out by physiological analysis. The anatomist separates and follows the one class of phenomena by his dissecting knife, interpreting the functions which he does not observe. Consciousness watches the other, notes their similarities and differences, refers them to their agent and records their products.

It is complex; of two elements. Let us, then, leave these physical or physiological conditions, and consult consciousness alone. We inquire of consciousness, What is the psychical act or state? She replies, It is a process complex in its nature, but instantaneous in time. It is complex, because the soul, in its single act, discerns two objects—its own condition and some material reality. One of these is subjective, and hence is called a *subject-object*; the other is objective, and is denominated an *object-object*. One element is called *sensation*, or *sensation proper*; the other is called *perception*, or *perception proper*. The one of these is an element involving feeling; the other is intellectual, being an act of knowledge. Each requires the other. Each is the attendant of the other. There can be no perception without sensation, nor can sensation occur without perception.

The elements unequal in energy; in the same, and the different sense. But though these two elements coexist, it is with unequal energy. The one activity is always at the expense of the other. If sensation is intense, perception is feeble. If perception is energetic and absorbing, sensation is weak and scarcely observed. The operation of this law is seen in the several senses, and in the

differing states or energies of single and separate senses. In vision, as compared with smell and hearing, perception prevails; while in the latter sensation is in excess. In the perception of bright and stimulating color, as contrasted with the discernment of form and outlines, sensation is conspicuous in the one, and perception in the other. If we look at the unclouded sun at midday, we cannot perceive distinctly, by reason of the blinding and painful sensations; if its disc is overcast, or a darkened glass is interposed, the perception is more distinct and easy, by the repression of the sensations.

This brief statement involves the doctrine that the soul in the same instantaneous and single act exists in a twofold activity. Stated in other language, it is, that every act of sense-perception involves the element of sensation and the element of perception. These elements need to be separately considered in order that we may understand their real character and their mutual relations.

Sensation proper
pertains to the
soul.

§ 112. *Sensation proper*, or the sensational element, comes first in order. This does not occur alone or apart. Pure sensation is simply an ideal or imaginary experience. Its nature can be determined only by laying out of view certain characteristics which always attend it. Though sensation always occurs with perception, it may be clearly distinguished from it. Sensation, thus considered, is

A subjective experience of the soul, as animating an extended sensorium, usually more or less pleasurable or painful, and always occasioned by some excitement of the organism. This definition implies,

First of all, that sensation pertains properly to the soul, as contradistinguished from material things or corporeal agents. The sensation of touch is not in the orange, the sensation of heat is not in the burning flame, but both are experienced by the sentient soul. The sensation of sweetness is not in the sugar, that of sourness is not in the vinegar. There can be no music when orchestra and audience are both stone-deaf. As all sensations pertain to the soul which experiences them, they can properly be said to be subjective. As the most of them are positively agreeable or the opposite, they are nearly akin to those emotions, as hope or terror, or those passions, as anger and envy, which are acknowledged by all to belong exclusively to the spirit, and to involve no relation whatever to matter or the bodily organism. Such feelings are not infrequently styled sensations, though improperly.

Yet experienced
by the soul con-
nected with an
organism.

§ 113. Second, the sensations, though subjective in the sense already defined, are yet experienced by the soul as connected with a corporeal organism, and are directly distinguished in this from emotions proper, on the one hand, and from perceptions proper, on the other. The soul has a subjective experience of heat, hardness, sweetness, sourness, etc., but it has this experience as an agent which is connected with and animates an extended sensorium. The several sensations, though like the purely spiritual emotions in being agree-

able, or the opposite, are unlike them in being felt by the soul as existing in a peculiar form of being and activity, viz., that of corporeal sensibility. That which feels is not the soul as pure spirit, but spirit as animating an organism.

It is but a part of the truth which Reid utters, when he says: "This sensation [of smell] can be nothing else than it is felt to be. Its very essence consists in being felt; and when it is not felt, it is not. There is no difference between the sensation, and the feeling of it; they are one and the same thing." "As to the sensations and feelings that are agreeable or disagreeable, they differ much, not only in degree, but in kind and dignity. Some belong to the animal part of our nature, and are common to us with the brutes; others belong to the rational and moral part. The first are more properly called *sensations*, the last, *feelings*." *Essays, Intell. Powers*, ii. c. 16.

Berkeley, *Theory of Vision*, says to the same effect: "The objects intromitted by signs would seem to him [a man born blind], as indeed they are, no other than a new set of thoughts or sensations, each whereof is as near to him as the perceptions of pain and pleasure, or the most inward passions of the soul." Cf. Dugald Stewart, *Elements*, etc., chaps. i. and v. p. ii. § 1; Dr. Thomas Brown, *Lectures*, etc., 19-25; Prof. Thomas C. Upham, *Elements*, etc., *Intellect*, § 49.

Reid certainly would not say that the pain, or the painful sensation, which is occasioned by a burn, a cut, or a blow, is precisely like the pain which is occasioned by the death of a friend, the loss of fortune, or the failure of a darling project. Both these classes of states, when not felt, have no existence; they both pertain to the soul, and to the soul only, as distinguished from the objects which occasion them. Both are alike subjective. Both are alike in being disagreeable, hence both are called painful. But one is experienced by the soul as connected with an organism, while the other is felt in the soul without reference to the sensorium at all. They are not merely unlike, as one painful sensation or one painful emotion is unlike another in subjective quality or intensity, but as a sensation is unlike an emotion, in that the one is felt by the soul as known by itself to act and suffer as animating an extended portion of living matter, and the other is experienced by the soul in its capacity to act and suffer without conscious relation to matter at all.

This peculiar feature of sensation is made still more obvious by the difference discerned by the soul between the sensation itself as a pleasant or painful experience, and the effort of the soul to retain or reject it; in other words, by the manifest difference between the sensation proper and the consequent desire or aversion. The one is an experience of the soul as suffering while consciously connected with the organism; the other is purely spiritual, the spontaneous acting of the soul's independent energy. In the sensation enjoyed or suffered, the soul is blended inseparably with the sensorial organism; in the reacting or resilient desire it is sharply contrasted with it. In the one it knows itself connected with that from which it imagines it might be detached; in the other, it knows itself to act as a purely psychical agent.

"The organism is the field of apprehension, both to sensation proper and perception proper; but with this difference: that the former views it as of the ego, the latter as of the non-ego; that the one draws it within, the other shuts it out from the sphere of self. As animated, as the subject of affections of which I am conscious, the organism belongs to me; and of these affections which I recognise as mine, sensation proper is the apprehension. As material, as the subject of extension, figure, divisibility, and so forth, the organism does not belong to me, the conscious unit; and of those properties, which I do not recognise as mine, perception proper is the apprehension."

"It may appear, not a paradox merely, but a contradiction, to say, that the organism is at once within and without the mind; is at once subjective and objective; is at once ego and non-ego. But so it is, and so we must admit it to be, unless, on the one hand, as materialists, we identify mind with matter, or, on the other, as idealists, we identify matter with mind. The organism, as animated, as sentient, is necessarily ours; and its affections are only felt as affections of the indivisible ego. In this respect, and to this extent, our organs are not external to ourselves. But our organism is not merely a sentient subject. It

is at the same time an extended, figured, divisible, in a word, a material, subject; and the same sensations which are reduced to unity in the indivisibility of consciousness are in the divisible organism recognised as plural and reciprocally external, and, therefore, as extended, figured, and divided. Such is the fact: but how the immaterial can be united with matter, how the unextended can apprehend extension, how the indivisible can measure the divided,—this is the mystery of mysteries to man.”—Sir William Hamilton, *Works of Reid*, Note D* 18 and *foot-note*, p. 880 (Cf. 35, 38, 39). Cf. J. Müller, *H.-B. d. Physiol. d. Menschen*, B. V.

The philosophers of the English and French schools have almost universally considered sensation as a phenomenon exclusively spiritual and subjective. Even Hamilton lays down the unqualified position, that sensation and perception are distinguished as feeling and knowledge. Most of them are by a logical necessity forced to distinguish perception from sensation, as being the apprehension of the objective cause or occasion of this subjective experience. They reason thus in the disjunctive method. Sensation must either be a phenomenon purely spiritual and subjective, or purely material and objective. It cannot be the last, because that would make it one with perception. It must therefore be the former. This conclusion was accepted with all the inconveniences and embarrassments which are familiar to the student who is versed in the history of the various theories of perception.

Those who reasoned in this way did not notice, that from their assumed premise another conclusion equally embarrassing might be derived, e. g., There can be but two classes of mental states—the simply and purely subjective and the simply objective. Sensations and emotions can neither belong to the last. Therefore both must belong to the first, or emotions and sensations are in their essential features properly classed together. This conclusion is contradicted by the conscious experience of every one. The only way to escape it, is to deny the original premise, and instead of the dichotomy or twofold division, to substitute another in its place which shall include a threefold possibility, viz., there are three classes of psychical phenomena possible—the purely subjective or incorporeal, the purely objective and corporeal, and a third, midway between the two, partaking of attributes common to both. These three are the emotions, the perceptions, and the sensations.

The sensations
localized.

§ 114. Third: It is implied, in what has been said, that all sensations are attended with a more or less distinct and definite relation of place in the sensorium. This relation of place is at first very indefinitely apprehended; indeed, it may not be attended to at all; but there must be furnished, in the original experiences of the soul, the means of discerning such a relation provided the attention is directed to the sensation. It is impossible to believe that a pain in the teeth or a pain in the head should not be known apart in place from a pain in the foot; that a burn in the foot and a wound in the arm should not give directly to the mind the apprehension of a different place for each. If the soul, in the experience of all its sensations, knows itself as animating an extended sensorium, then in each sensation it knows itself to be affected in some separate part or portion of this extended organism which it pervades.

Those who regard sensation as a purely subjective experience or phenomenon, exclude from it all the relations of place or locality. These relations they appropriate to the causes of the sensations. If an infant has a pain in the foot and a pain in the head, as sensations or pains these are simply spiritual or psychical experiences. It is only when the causes of these phenomena are discovered that the relations of place can be discerned. A different view of the nature of pure sensation involves different consequents in respect to all the relations of place.

When it is asserted that every sensation gives or might give a relation of place, it is not intended that the relations of place involved in and given by the direct experience of an original sensation are or could be apprehended so completely and so definitely as they are by the aid of experience and the acquired perceptions; but only that some knowledge, or the materials for such knowledge, must be furnished in the original sensations.

Differ from one another in quality and definiteness.

§ 115. Fourth: The different sensations, as subjective experiences of the soul, differ greatly from one another in respect to quality and intensity; in other words, they differ in kind and degree. Each of the leading classes of sensations differs from each of the other classes, as the sensations of sight from the sensations of touch. Under each of these broadly distinguished classes or kinds, special sensations differ from one another; as the different tastes, feelings, smells, colors, etc., etc. What are called the same sensations, differ also in energy, strength, or intensity; as one shade of the same color, as red, is deeper or more intense than another shade; one odor is more pungent than another. These several sensations are the subject-matter of direct or intuitive apprehension. We know that they are, and we know what they are by direct experience. We know them in their relations also—*i. e.*, in their likenesses and differences, positions, etc.—by direct discernment. No other explanation can be given of these facts than that we know them to be, and know what they are, by direct intuition.

Fifth: The different sensations differ in respect to the greater or less definiteness of the part or place of the sensorium which is affected. Thus, a sound or a smell is far less distinctly defined in any relations of place than a sight or a touch. But more of this in another place.

We come next to *perception* or *perception proper*.

Perception proper, an act of pure knowledge. Its object.

§ 116. This, as has already been explained, is no separate act or state of the soul; it is only a separable or distinguishable element of a single complex act. Perception, as

such, is, First: Clearly and distinctly an act of objective knowledge, and of knowledge only. The sensational element is an element of feeling, attended, indeed, with the knowledge that the soul which feels animates an extended organism; but in the perceptual act the soul knows, and only knows.

But if it knows, it knows some being as its object (§ 48). But what being does it affirm? We answer, The being which is the joint product of the material agent or substance and the sentient organism. What we perceive when we touch and see, much more when we smell, hear, and taste, is that which is prepared for our knowledge by the action of the excitant, whatever it may be, whether objective or subjective, and the organism animated by a sentient soul. In perception proper we do not know the excitant apart, nor do we know the organism apart, only the result of their joint action. This we know as an object, with which the mind is confronted, both as a sentient and as a percipient. As a sentient it responds to its presence by that subjective condition called sensation; as a percipient, it knows the object to be.

The agency of the soul in its acts of knowing, as has already been explained, should be carefully distinguished from its agency in preparing and even in presenting objects for it to know (§ 47).

Its object a non-ego. What kind of a non-ego.

§ 117. Second: This knowledge is objective—*i. e.*, the soul not only knows the object to be, but it knows it is not itself. What it knows is a non-ego, a not-me, a not-self. But from

what self, or *ego*, does it distinguish the object? or what kind of non-*ego* does the perceiving soul distinguish? Is it what is usually called a material object, distinguished from the organism or the body which the soul animates and moves? or is it the organism itself which the soul distinguishes from itself, though it animates and moves it? We answer, In perception, comprehensively viewed, both of these objects are distinguished by the soul from itself, viz., the material object, which is not the body, and the body itself, which is not the soul. The process is not complete till both these objects are distinguished from one another, and from the soul itself. But our present inquiry is, Which of these objects is apprehended in perception proper? which is known, or might be known, in connection with every sensation, or in every act of sense-perception? We answer, The bodily organism itself, or rather that part of the sensorium which is excited to action. What the soul directly perceives—i. e., distinguishes from itself—is its own sensitive organism, so far as it is excited to sensation. This is that which it knows to be not itself, even though it knows that in sensation it is intimately connected with it. The immediate object of perception proper is the sensorium in some form of action.

It deserves to be carefully kept in mind, that, as there are three non-*egos*—viz., the not-body as distinguished from the body and soul united, the body as distinguished from the soul, and the sensorium as distinguished from the soul as pure spirit—so there are three *egos* brought into consideration—the soul as animating or connected with the sensorium, the soul as connected with the body sensed and perceived, the living body as a whole; and the soul as distinguishable from both sensorium and body. In analyzing and defining sense-perception, the attention should be carefully directed to the inquiry, Which of these *egos* or non-*egos* is intended?

It is not intended that, in the order of time, the infant does, in the earliest development of the reflective consciousness, apply the pronoun I to the soul as distinguished from the body. It is most evident that at first, and for a very long period often, this appellation is applied to the soul and the body as a complex whole. We need not even inquire what distinctions are made earliest in the order of time or of actual experience, but rather, what are necessary in the simplest acts of the soul—in those states which our subtlest and ultimate analysis can distinguish, but cannot divide. What are those distinctions, the discernment of which no process can explain or account for, but which must be ascribed to an original endowment of the soul manifesting itself in a necessary and sovereign act?

§ 118. Third: The object in perception proper is not only known as the non-*ego*, but it is known as extended. Even in sensation proper the soul knows itself as united with the extended sensorium; much more when the soul, by an act of intelligence, distinguishes this sensorium from itself as a purely psychical agent, must it know the object to be extended which it as it were sets over against itself. We do not here ask what extension is, or how it is possible that the unextended spirit can know extended matter; nor do we ask what are the relations of extension to space, either in the order of knowledge or

An extended
non-ego.

of being. These questions are reserved for future discussion. We record only what the mind actually perceives, as attested by our experience of the act or process.

This doctrine, stated in the terms of a more exact analysis, is this: The soul, in sense perception, knowing the sensorium in action, may know it in the two relations which it holds to itself, as at once a *sentient* and *percipient*. In the one relation it knows the sensorium as united with or pervaded by itself as a *sentient*: it knows it sensorially—i. e., so far as it experiences sensations. In the other relation it distinguishes it—the sensorium as being an extended object—from itself as a *percipient*—i. e., it perceives a non-*ego* contrasted with a *percipient ego*.

No one can deny, that conceding that the soul in sensation is consciously united to an extended sensorium, it must immediately perceive this sensorium when aroused to action. But one may doubt whether this is all which the mind perceives. It may be asked, whether the extra-organic cannot be perceived immediately as truly as the intra-organic. Upon the theory here proposed, the *not-body*, or *extra-organic matter* is the object of an acquired, but not of a direct, perception, by a process which will be explained hereafter.

The alternative theories of direct perception are two. One makes sensation a purely spiritual experience, and gives to the mind a power of directly perceiving its attendant object or its cause—known directly or inferred somehow to be extended.

The other makes sensation to be organic, and of course to involve place and extension, and perception to be the direct knowledge of an extra-organic object or agent, which is also extended and causal of the intra-organic sensation.

It may be admitted, that the last theory is possibly true, but it must be shown to be necessary in order to account for the facts, and also to be most accordant with processes known to be performed in the early growth of perception. It is also inconsistent with the occurrence of subjective sensations. The question is of no special importance, except as it throws light upon the development of the intellect. But see § 156.

§ 119. We ask, fourth: In the exercise of which of the senses does the mind distinguish the non-egoistic and extended object—in the exercise of one or two, or of each and all? The views which we have proposed concerning sensation involve the necessary consequence that perception proper occurs in connection with each of the senses. If every sensation involves the apprehension of the extended sensorium with which the soul is connected, then it follows that it is possible to perceive this sensorium, to whatever sensation it is excited, and that every sense gives the knowledge of an extended non-*ego*. Some of these senses do this with greater indefiniteness than others, it is true—as the sense of smell compared with the sense of touch, but all with equal reality; if, indeed, it is true that no sensation can in fact occur without perception.

It needs here to be observed—as, indeed, we cannot too often repeat the remark—that the perception which we are here considering is the perception of the not-spirit, or the direct apprehension of the extended non-*ego*, and not at all the perception of the not-body, or the reference of a sensation—e. g., of smell to an object as its cause, viz., a rose, or a honey-suckle.

Those psychologists who make sensation to be a purely *spiritual* or *subjective* experience of merely *intensive* quality, and make perception to be the apprehension of the cause of these so-called feelings, either limit perception to the sensations of touch and sight, excluding it from smell, taste, and hearing—as does Reid—or confine it to touch only, as Fugald Stewart and Dr. Thomas Brown.

The philosophers of the Continent who agree with them in their views of sensation—as for example, those of the school of Herbart and Beneke—agree with them in deriving the knowledge of the external world from sight and touch only, either by direct perception, as Kant, or by some process of induction or judgment founded on experience. A particular account of their views will be given under Theories of Perception. At present we need only observe that all these theories rest on the gratuitous and unauthorized assumption that any sensation is or can be purely intensive or spiritual.

The extension and externality. All objects not given with equal clearness.

But while each and all of the senses do alike give us an extended and external object, they do not give it with equal distinctness and clearness. As we have already observed, the senses of smell and hearing are far inferior in this respect to the senses of sight and touch; and so far inferior, that they seem to many not to give it at all. The muscular sensations are also more conspicuously present in the movement and direction of certain organs than in the management and experiences of others. As a consequence, the attention is almost entirely withdrawn from the apprehension of externality and extension which pertains to these sense-perceptions, and hence it has been denied that through these senses there is any proper perception.

The varying relations of sensation and perception proper.

§ 120. This leads us to another topic—the varying relation of the sensational and perceptive element in different states of sense-perception. The general law is, that in every state these elements vary inversely—i. e., as the sensation is stronger, the perception is weaker, and *vice-versa*. The operation of this law is illustrated in the different sensations of the same sense as compared with one another, and also in the different senses.

In different sensations of the same sense.

Of different sensations of the same sense we observe, that in some the attention is occupied more with the sensation, while in others the object which it reveals is more thought of. This is true of tastes, smells, sounds, touches, and sights. If any of these are very agreeable or disagreeable, the subjective pain or pleasure which they give, solicits and absorbs the soul's energy, almost or entirely to the exclusion of all apprehension of the organism, or of any thing external. If they are what we call indifferent or unexciting, there is opportunity for the mind to attend to the relations of diverse quality, of place, form, outline, which the particular sense admits of. It has passed into a proverb, that certain sensations are absorbing, transporting, ravishing, enrapturing, and ecstatic; all of which terms indicate the complete occupation of the soul's energy in subjective enjoyment, or, as the case may be, in pain and agony. We freely remark of others, that in them we are cool, unexcited, not carried away, self-controlled; which epithets imply the possibility of any intellectual activity which may be required, the energy of simple perception being, of course, included.

The most obvious and striking illustrations of this difference may be seen in different experiences through the eye and the hand. The apprehensions of color are more sensuous; those of form and outline are more perceptive and intellectual. In gazing upon rich and gorgeous coloring, whether it be of a splendid sunset, of brilliant autumn foliage, or of a glowing painting, the enjoyment is more intense and the excitement is

more akin to pure emotion. In the apprehension and comparison of form, outline, and grouping, whether there is more or less of color, or none at all, the perceptual element predominates, and sometimes rises into the purely intellectual. But just in this proportion does the sensuous and passionate sink and give way.

In touch, if we take a burning or frosted implement, we are so occupied with the pain, that we do not notice its form, surface, weight, and many other peculiarities which a nicer handling would reveal, which delicate handling is rendered impossible by the absorption of the soul with its sensations. On the other hand, the delicate intellectual touch, which apprehends minute constituents, slightly varying surfaces, gentle outlines, fine edges, etc., requires as an essential condition that the sensations be not at all obtrusive. He that passes his finger over the edge of a razor in order to judge of its fineness, must be careful that no painful sensations, as from a cut; or pleasant sensations, as of titillation, disturb or distract the delicacy of his perceptive touch. In all these examples it is to be noticed, that in sensation proper we are occupied with our subjective condition as pleasant or painful; while in perception proper we apprehend an extended *non-ego*.

The illustration of the varied activity of the sensational and perceptual element in the different senses will be given in the following chapter.

It should be remembered that the knowledge of an extended and external *non-ego*, which is gained through any single sense, or through each and all of these senses when considered singly, is very different from that complete apprehension of the extended and external world which is effected by the combination of the products of the several senses into single objects—which is matured by the processes of acquired perception, coupled with the insight of reflective thought.

CHAPTER IV.

CLASSES OF SENSE-PERCEPTIONS.

We have only crossed the threshold of our inquiries in respect to perception. But our previous analysis has established the conclusion that sense-perception is an act of knowledge gained in connection with sensations experienced by the soul as connected with an extended organism. The beings known in connection with each of the senses are properly termed *percepts*. These percepts are all extended *non-egos*, and they are known in the *relations* of extension and externality. These percepts are, however, various in their quality and diverse in the organs and conditions by which they are gained. To understand this, we must consider that

Three classes of sense-perceptions. The muscular.

§ 121. The sense-perceptions may be divided into three leading classes: the *muscular*, the *organic*, and the *special sense-perceptions*. This division is in part directed by the

character of the sensations themselves, and in part by their bodily conditions.

The *muscular* sensations, or sense-perceptions, comprehend all those which arise from the varying conditions of the muscles when in action and at rest. The muscles constitute a very large portion of the substance or structure of the body. They also pervade or are closely connected with those parts and organs which are not muscular. They suffer various changes, with which are connected a great variety of psychical experiences. These bodily changes are apprehended directly in or through sense-observation; the attendant psychical phenomena are known directly by consciousness. Among these are the passive sensations of repose, of pleasant and painful fatigue, of distressing convulsion and cramp. To these should be added the sensations which arise from violently cutting, stretching, bruising, tearing, or otherwise injuring the muscular fibre. Those which are appropriately called muscular sense-perceptions are those which depend on the contraction and relaxation of the muscular fibres, or the varying relative position of the muscles. As we slowly stretch or violently jerk out the arm or the finger, as we rotate the wrist, as we tread or kick with the foot, as we strain the whole body to lift a heavy weight or to push over or against a resisting obstacle, or as we exert a part or the whole of the body in manifold conceivable motions or efforts, we experience as great a variety of muscular sensations. Scarcely one of these is distinguished by a separate name; and the greater part of them escape common observation.

They are ranked lowest in the scale of the sense-perceptions, because they are least definitely placed in the sensorium, because they cannot be distinctly recalled to the memory, and because they are usually the least positive in the pleasure and pain which they occasion. They serve most important uses, however, as we shall see, in enabling us so to direct and regulate the bodily motions as to distinguish the individual body from the rest of the material universe, and to defend it against serious or fatal injuries. It is contended by many that we derive our first knowledge of extended matter from the muscular sensations, as through their varying movements the infant first explores every part of the sensorium within, and that it is from the sensorium thus explored that it derives its measures of the material world without. Some hold that there are distinct though vague sensations appropriate to the muscles when in repose, as truly as when in motion; that in these sensations throughout the whole body, slight differences are experienced, called by some their *local coloring*, through which the relative position of each is understood, and the sensations themselves become signs of place, or *local signs*. W. Wundt, *Beiträge zur Theorie der Sinnes-Wahrnehmung*, Leipzig, 1862; Lotze, *Med. Psychologie*, Leipzig, 1852; *Mikrokosmos*, Leipzig, 1856-1864.

A few psychologists of a recent school have questioned whether the existence of muscular sensations is as well-established as had been supposed. They explain the direction and control of the limbs through the muscles very largely by the varying sensations of the skin, etc. But the more recent experiments have indicated decisively special nerves for muscular sensations and the connection of their excitement with muscular activities, independently of the skin.

The muscular apparatus, as attended with and regulated by means of the muscular sensations, is called the locomotive apparatus, and the exertion of it the "*locomotive energy*," as the term is applied by Hamilton.

The organic. § 122. The *organic* sensations are those which depend on the healthful or diseased condition of the vital organs; such as the stomach, the lungs, the heart, the other viscera, and the nerves. When these organs are entirely healthy, and their functions, as of digestion, etc., are normally and harmoniously performed, they are attended with no very positive or distinctly noticed sensations. When they are injured or diseased, the sensations which attend these conditions are always unpleasant, often distressing, and invariably most readily distinguished and recognized. The healthy man does not know that he has a stomach. The dyspeptic scarcely knows that he has any thing besides he is so absorbed by the uncomfortable or painful sensations that are occasioned by the diseased organ. The same is true of a man whose lungs, heart, or nerves are diseased. This class of sensations are more readily distinguished and recalled than the muscular, because they are more definite and positive.

Common sensibility. The question is still in dispute, especially among physiologists, whether there is not a so-called common sensibility or vital feeling—i. e., a sensation equally diffused throughout the whole bodily frame. Of this common feeling, or feeling of life, the sensorium, *as a whole*, is considered as the single organ, just as its separate parts are the organs of the special sensations. The phenomena on which the advocates of this theory rest their views are the feelings of bodily exhilaration or depression which are experienced at times by all men, and which cannot be assigned to any part of the frame as their seat or place. Inasmuch as these sensations in our experience seem to be diffused through the whole body, and inasmuch as no organ can be discovered as their seat, it is argued that this common sensibility ought to be enumerated in addition to the special sensations. But this is denied by others, because no organ can be assigned for such a function.

A view reconciling the two conflicting theories would make the diffused nervous substance the organ or seat of this general feeling; while its specialized or determinate parts are the organs and seats of special sensations. The feelings of heat and cold, of shivering, etc., etc., might perhaps be assigned to the organism as a whole, as well as many other undefined internal feelings which can be fixed in no place or allotted to no organ, either through inner experience or senso-observation. For the psychologist, the question has little interest or importance, except, perhaps, in some relation which it may be supposed to have to the apprehension of extension and space.

The organic sensations are often blended with the muscular. The vital organs are in part muscular, or intertwined with muscular fibre, as the heart, the stomach, etc. Their special affections are therefore experienced in constant connection with normal or abnormal muscular sensations, and both are assigned to the same part of the sentient organism.

The special sense-perceptions. § 123. The *special sense-perceptions* constitute the remaining and the most important class. All these are distinguished by this marked peculiarity, that they are experienced through organs specially constructed for the sole function of sense-perception.

They are the so-called five senses: *Smell, taste, hearing, touch, and sight*. Each of these is clearly distinguished from every other, and to each of them is assigned its own organ or organs.

Smell : its organ, conditions, and objects.

The organ of smell is the nostrils, which open into the two nasal fossæ, the plates of which are overlaid by a mucous membrane called the pituitary membrane. The passages between these plates are somewhat tortuous, giving extent of surface for the expanse of membrane, and the ramifications of the olfactory nerve.

This organ is in immediate contiguity with the organs of taste, with which it acts in ready sympathy. Offensive smells occasion nausea and disinclination to food. Savory odors, on the other hand, stimulate the appetite.

It is generally believed that smell is excited only by the contact of the interior surface of the organ with minute portions of matter, or gases diffused through the atmosphere. Many substances that are highly odorous are also extremely volatile, and diminish rapidly in bulk or weight by exposure to the atmosphere. In most, if not all such cases, the substances are such as can be readily acted on by oxygen. On the other hand, the fragrant woods, as sandal-wood and cedar, continue for a century to be as fragrant as at first, and their substance is for years, to all appearance, unchanged and unchangeable.

Names and character of the sensations.

But whatever uncertainty there may be in respect to the occasions of these sensations, with the sensations themselves we are all familiar. Their varieties are almost endless. The odors from flowers, from food, from perfumes, from woods, from earths, from metals, and from many other objects, are too numerous to be classed or named except in a very general way. We *class* them in a few general groups or divisions, as quickening, refreshing, depressing, sickening, aromatic, spicy, etc., etc. We *name* them usually from the objects which excite them, as the odor of the violet and the lilac, of the rose and the tube-rose, of the peach and the apple, of cedar and camphor-wood.

The influence of odors and smells upon the nervous system, and through this upon the activity and energy of the soul, ought not to be passed over. Fragrant odors, as of flowers, freshly dried hay, spicy herbs, those of certain perfumes, of pungent salts and medicines, excite the energies and refresh the spirits; while sickening and stifling smells depress the energies, and induce discouragement and faintness. It is not easy in all cases to separate the influence of the sensation on the nervous system, from some specific action of the substance smelled upon the stomach or the lungs, or from a purely physiological action upon the nerves.

They are sense-perceptions.

It is to be remembered that the so-called sensations are in truth sense-perceptions—i. e., they involve apprehended relations of externality and extension. The experience of every odor, according to the explanation already given, must be referred to some part of the sensorium. These sensations are, however, very undefined in their place and limits, and hence it has been supposed they are purely psychical. They cannot be distinctly recalled in the imagination or memory. Hence, in our actual perceptions of objects, they are referred directly to the object as seen or handled. That is, the object seen or touched occupies the attention and engrosses the memory, and not the

object smelled. Because of this vagueness in these sense-perceptions, and because many of their material occasions or agents are known to be invisible, impalpable, volatile, and diffusible, the sense itself is fancifully yet pleasantly said to reveal the interior and ethereal essence of material things, and hence to be especially elevated and refined in its own nature.

The language and terms taken from this sense are transferred to super-sensual objects, especially to the moral and the religious. The odor of incense, 'the offence that is rank, and smells to heaven,' and the like, are examples of such an application.

§ 124. The organs of *taste* are the tongue, the palate, and a portion of the pharynx. These are also truly, though imperfectly, organs of touch. But owing to some peculiarity of the mucous membrane with which they are encased, they yield a variety of special sensations called taste. The tasting organ, so far as it can be traced, consists of minute papillæ, which cover the upper surface of the tongue and the inner cavity of the mouth.

Sapid substances, to be prepared for tasting, must be made liquid. Those which are hard and compact, must be broken by mastication and dissolved in the saliva. The harder the substance and the slower the process of dissolving, the longer does the taste continue.

The sensations of taste are various in kind and almost countless in number. They are capable of being so combined as to produce singular modifications and striking contrasts. They can thus, to some extent, be changed by custom and formed by art. Tastes that are at first positively disagreeable, become pleasant by being connected with a stimulant effect upon the nervous system—as the pungent and fiery taste of strong liquors, and the nauseating taste of tobacco. Or the sense-organ itself becomes less sensitive in its energy, and of course less offended by the sensations which were at first more intense, and therefore positively disagreeable.

Tastes, like smells, are designated by a few general epithets, as pungent, bitter, sweet, spicy, acrid, sharp; more precisely by the objects which occasion them, as the taste of pepper or alum, of the peach or the plum, of different vegetables and meats. Of this language or vocabulary of taste we may say in general, that it is taken originally from the sense of touch, as the obvious meaning of some of the terms, and the less obvious roots of others, both indicate. The reason is obvious. The organ of taste is also an organ of touch. The tongue touches as well as tastes. Certain tastes are attended with certain touches.

It ought not to escape our notice in this connection, that the sense of the beautiful and the sublime in nature, art, and literature, and the capacity for judging rightly of its occasions or sources, is called *taste* in many languages; a singular transfer of a term from one of the grossest of the animal capacities to one of the highest of the psychical endowments.

It is explained by the fact that the corporeal sense of taste is susceptible of fine discriminations and of great delicacy of culture.

The gratifications of this sense constitute a large portion of our animal enjoyments. When these gratifications are regulated by a regard to health, to future capacity for intellectual, moral, and religious activity and culture, and especially when they are connected with social and domestic pleasures, they are by no means to be despised or disesteemed. On the other hand, it is to be remembered that, when denied or when pampered, they easily degenerate into the most imperious cravings of our nature. Hence they are perverted so easily, and ripen so soon into frightful and debasing appetites.

The question is never mooted, whether the sensations of taste are purely subjective, or independent of all perceptions of externality and extension. They cannot, in fact, be experienced apart from the exercise of touch, which, by the concession of all, involves the apprehension of these relations. It is inconceivable that the one should not accompany the other. We can form no imagination of a taste which is not also a touch, bringing into active requisition the discrimination of external and extended objects. Nor is taste, as a sensation, conceivable except as an affection of that part of the sensorium which pervades the surfaces of the tongue and palate.

§ 125. The sense of *hearing* comes next in order. Its organ is a complicated and convoluted bony tube or chamber, resembling somewhat the interior of a snail-shell, and furnished externally with an expanded appendage, the surface of which is corrugated somewhat after the manner of the bony passage within. The object of the external ear (which with the internal constitutes the organ), is to receive, convey, and quicken the vibratory action of the air till it reaches the tympanum. This is a parchment-like substance, which bears, through a chain of bones (*osselets d'ouïe*), upon a liquid within. The arrangement of this entire structure, when judged by mechanical principles, is obviously adapted and designed to carry and increase vibratory action. But the vibrating tympanum is not itself hearing. Though we seek for the spirit of sound in all these narrow and winding chambers, we cannot find it there; but it flees from our search like a shadow or a mocking spirit. It is the soul which lives in the sensorium that hears. When the tympanum is made to vibrate with requisite intensity and rapidity, and the nervous apparatus is unharmed, and the soul is attent, then does it experience those peculiar sense-perceptions which we call the sensations of sound.

Every body which emits or conveys sound is susceptible of vibration. The sonorous body with which we are most familiar, is the atmosphere, which, by being everywhere present, is the constant and the pervading medium of sound. Many solid bodies are, however, capable of more delicate vibrations, and hence are more perfect conductors of sound; or perhaps they owe their effect or

the sensorium in part to the vibrations which touch convey through the bony structure. A stick of timber will convey to the ear in contact with it, a whisper or the scratch of a pin for scores or hundreds of feet. If the ear is brought in contact with a musical instrument, either directly or through the medium of some intervening substance, the intensity of the sound is greatly increased.

Of these sensations there is a great variety. What deserves especial notice is, that each one of this endless variety is readily distinguished from every other, and very many of them can be recalled and recognized. A single human voice is capable of emitting a great variety in respect to quality, tone, and pitch. The voice of each individual has its distinguishable characteristic in each of these particulars. The wind sighs and whistles and groans in the forest, or beats and rolls among the clouds like resounding waves. Almost every substance has a sound of its own when it strikes or falls upon another, and this sound can be varied in quantity and quality. Of these varieties of single sensations, some are agreeable, others are offensive; others still are indifferent, but clearly and readily distinguishable. These last serve the most important uses, as they convey definite and important knowledge of the qualities of the variously sounding bodies.

Single sensations of sound are distinguished by quality, by intensity or loudness, and by volume or quantity. The differences in simple quality are surprisingly numerous, and are characterized by a variety of expressive epithets. Intensity describes the force of the sound, irrespective of quality: as low or loud, strong or weak. Volume characterizes the sound as completely taking possession of that part of the sensorium which is capable of being affected, and excluding all other sounds but itself. Such epithets as *broad*, *massive*, *overwhelming*, etc., etc., express this characteristic. Besides these obvious differences, there are others less discernible to common apprehension, which are observed and named by elocutionists and musicians. The epithets by which they are characterized are technical, or terms of art, and hence are not incorporated into common speech. The epithets which we commonly hear are such as low and high, feeble and loud, soft and harsh, smooth and rough—sweet, gentle, clear, piercing, light, heavy, etc., etc. All these epithets, it will be noticed, were originally appropriated to the other senses, especially to those of touch. Some are derived from taste and sight. To a limited extent, sounds are named from the objects which excite them: as the bell and glass-like, the wooden, the metallic, etc., etc. But in general, the sensations themselves are so definitely and sharply distinguished, that they admit of a great variety of epithets which directly describe their subjective quality.

Sounds in succession and combination. Melody and harmony.

Besides these distinguishing differences in single sensations of sound, there are others which belong to sounds when in succession and combination. Sounds of almost any quality

become pleasing when uttered in any regular succession ; especially when a series is made to repeat and to return upon itself, and its measures or intervals are marked by accent or beat. Examples of these are the beating of a drum to a tune, the rhythmical measure of well-sounding prose, or the more regular and marked repetitions of poetic verse. If the sounds possess musical quality, these repetitions constitute melody, giving exquisite sensuous pleasure to the ear, and, by expression, speaking so movingly by the soul. To this is superadded the more artificial and refined attribute of harmony, when sounds of different musical quality are given in concord, greatly enlarging, enriching, and elevating both the sensuous and expressional resources of music. Melody and harmony combined, when added to what culture has done for the voice, and art for the improvement of instruments, are the grounds of the elevated enjoyment that is ministered by the varied works of musical genius.

§ 126. The sensations of sound are invested with even a higher interest, and applied to a still more elevated use.

The condition of oral language.

Without the sense of hearing, vocal utterances do not become sounds ; and without vocal utterances as heard, there could be no language. As addressed to and affecting the senses, sounds are pleasing or displeasing, musical and melodious or the contrary, harmonious or discordant ; as significant of human thought and feeling, they are endowed with a wondrous and almost a sublime power. When we listen to a foreign language of which we are ignorant, or when we cannot catch the sense of our mother-tongue, it is to our ears a jargon or a chatter, or, at best, but a pleasing flow of insignificant sense-perceptions. But as soon as these sounds are understood, they are transformed, and, as it were, transfigured into a new nature by subserving a nobler use. They become the audible expressions of thought, in its most subtle distinctions and its most complicated connections. By this means—literally, this intervening medium—thoughts are communicated from one mind to another ; they are forever fixed, and become the permanent possession of the race.

Not only are sounds significant of thought ; they also express feeling. Even simple and inarticulate tones do this, especially if the tones are musical, or partake of musical quality. The whine of the beggar, the command of the master, and the threat of the enraged, are expressive as tones, even when no words are uttered, or when the uttered words fail to be understood. A plaintive or a triumphant strain of music is easily interpreted, though no thoughts are uttered in words. But when thought and feeling are both conveyed, the one by clear and well-chosen words, and the other by an expressive elocution, and the soul is enraptured and elevated by eloquent speech, then the resources of sound and the importance of hearing begin to be appreciated. When, again, poetry and music lend both grace and expression to thought and feeling, we have a still higher example of the dignity of a single

Expressive of feeling.

sense, and the wondrous uses to which it may be applied in the service of the soul.

In view of these relations, the sense of hearing has been ranked higher than any other. It effects a connection between one soul and another; it enables the spirit to breathe out feelings which even articulate speech cannot utter. Its dignity and worth are especially illustrated in the case of the blind. It is to them the subtle conveyancer of those emotions, which to others the eye, the countenance, the attitude, and the gesture all combine in expressing. To the blind the voice softens in tenderness, thrills with love, is harsh from anger, and lingers in entreaty. To him every tone breathes an expressed emotion. An intelligent and educated blind man once remarked with great intensity of meaning: "The human voice is to me the divinest endowment of man."

Sounds; sense-perceptions.

We need, perhaps, to repeat the observation, that what the soul experiences in hearing is truly a sense-perception—i. e., as already explained, it is an affection of the soul as connected with the extended organism with which it connects and from which it distinguishes itself. It is common to conceive of sound as a purely spiritual affection, involving no relations to extended matter. It is confidently asserted that, were the soul capable of hearing alone, it would experience the successive sensations in listening to a musical air as only a series of delightful emotions, as phenomena purely and simply subjective. This, for the reasons already given, we think incorrect. These sensations, like all the others, are assigned to some place in the sensorium, and if not bounded by definite limits, involve nevertheless the apprehension of an extended surface. These apprehensions are so indefinite, indeed, that ordinarily we do not regard them; because we do not rest in the sensations, but use them as signs of the sense-perceptions, or the relations which they involve. Instead of the sound, we think of the sonorous body; or, if the sensational element is agreeable, we think of its subjective quality; or, if it excites or suggests a series of warm or elevated emotions, we are absorbed in these. In other words, we are usually too busy in the interpretation of sounds to think simply of them as sound-perceptions. We leave the sound itself unnoticed, except so far as its relations signify something, and we pass at once to that which it signifies; in the case of tangible or visible qualities, to this class of properties; when it conveys thought or feeling, to the intellectual or emotional import which we interpret. The range of this significance is so vast, varied, and interesting, that it is not surprising that it occupies our chief attention, and leads us to overlook the relations of the sound to place or extent in the *sensorium*, and even causes that we fail to advert to the fact that it has such relations. These are not obtrusive to the attention at any time; at best, they are but vaguely apprehended; but that they are perceived, is manifest from the considerations already noticed, and also from this, that an intense or extraordinary sound always distinctly affects the ear—i. e., a portion of the sensorium which is defined to our apprehension, though vaguely.

§ 127. The *sense of touch* comes next in order. The organ of this sense is the skin. The skin is the external covering of the body, and the lining of certain internal cavities, as the mouth. The sensations depend on the action of certain minute *papilla*, which are placed beneath the external cuticle, and each one of which

The sense of touch. Organ.

encloses the termination of a nerve, or of a nervous branch or branchlet. Different portions of the skin are more or less sensitive, and the perceptions which are gained through them are more or less delicate, according to the number of the nerves and the fineness and compactness of the nervous terminations. The thickness or thinness of the external covering or cuticle is also an important circumstance. In general, we may say that those portions of the body in which the perceptions are least acute and discriminating are the most scantily supplied with nerves, and their branches extend over a very large surface—in some cases over several square inches. In the more sensitive parts of the body, on the other hand, there are very many distinct nerves and nervous branches and branchlets.

The distinguished physiologist, E. H. Weber, was the first who instituted a series of careful experiments, in order definitely to ascertain the different degrees of sensitiveness in touch which are natural to different parts of the body. He employed for this purpose the points of a pair of dividers, which were separated more or less widely and applied to different parts of the body. He ascertained that in some parts of the body these points could not be perceived as separate, unless the dividers were opened as widely as three inches; while in others the extremities needed to be only the thirty-sixth of an inch apart in order to be distinctly perceived as two. Similar experiments have been made by other physiologists. The tip of the tongue, the lips, and the ends of the fingers, are the most sensitive and discriminating organs of touch. In some animals, the lips—as of the walrus and the seal—are exceedingly sensitive. The antennæ of many insects are supposed to be endowed with extraordinary susceptibility of touch. The human hand, inasmuch as it is lined with a sensitive covering, and—through its connection with the arm and shoulder, and its division into thumb and fingers—is provided with an apparatus especially adapted to regulate and direct the application of touch and pressure, is preëminently the organ of touch. E. H. Weber, *De Pulsu*, etc., 1834; also art. *Gefühls-sinn*, Wagner, H.-W.-B. *der Physiologie*. See also Sir Charles Bell, *The Human Hand; its Mechanism*, etc.

It is an essential condition of a sense-perception of touch, that the object should be actually applied to or brought in contact with the organ—i. e., with some portion of the surface of the body. According as this application is made with greater or less force, the sensation varies in intensity and the perception in distinctness, and sometimes the quality of the sensation changes in its nature. A light pressure or gentle touch, in the ordinary and normal conditions of the organ, is usually favorable to distinct or delicate perception. If the pressure is increased, the sensation may become excessive and unpleasant, and even positively painful; while the perception is less acute, owing, probably, to the compression of the nerve or nerves. In some cases, the very slightest contact that is possible, with a careful avoidance of pressure, as in the touch of a feather, is attended with the greatest sensibility and the acutest discernment. But the force of the application of the organ to the object of touch depends usually on muscular effort. It

scarcely ever can happen that muscular effort is not called into requisition, either in positive and direct pressure, as of the hand or finger, or in withholding from pressure beyond a certain degree, or in resisting pressure when it is imposed from without. All these efforts are directed, measured, and controlled by means of varying muscular sensations which attend each form and degree of exertion.

Variety of sensations involved in touch.

§ 128. Hence it is that the muscular sensations always attend and often seem to be blended with the perceptions that are appropriate to touch. In the acquired or complex perceptions of touch, these muscular sensations play a conspicuous part, as we shall see in the appropriate place (§ 145). In common language, and in the earlier classifications of philosophers, both psychologists and physiologists, the muscular sensations were assigned to the sense of touch. So are and were the sensations of temperature, many of which arise from contact with a body warmer or colder than the touching organ, and hence in experience and imagination are referred to touch proper. Inasmuch as these various classes of sensations are all concerned in many of the perceptions of touch, it is necessary to consider each apart.

Sensations proper of gentle touch.

The first class are the sensations of *gentle touch*, or of *touch proper*. These sensations are occasioned more frequently by feeling an extended surface, but they may, and often do, arise from gentle contact with the extremity of a pointed body. Sensations thus arising are neither pleasurable nor painful. One is scarcely distinguishable from another by its agreeable or disagreeable quality. Hence none of them can be readily reproduced in the memory. Pressure against a surface, or motion over it, both involving muscular sensations, seems to be required in order to secure from different substances sensations sufficiently positive and energetic to enable us to distinguish the substances themselves, and to recall to memory the sensations which they occasion.

Sensations involving violence or injury.

The second class are the *acute* and *often painful* sensations that come from any substance that does violence to the organ, as the prick of a pointed substance, the cut of a knife, the stroke of a whip, the bruise from a stick. These sensations are all distinct and energetic, and occasion a shock to the nervous system which is more or less violent. They are more definitely localized than the sensations of touch proper, and more distinctly revived and recalled. The sensitiveness of the skin to affections of this kind is not proportioned to the sensitiveness of its touch. It was proved by the experiments of Weber, and others, that those parts of the surface of the body which are furnished with the fewest and the most sparsely ramified nerves and branches of nerves, and are the most incapable of sensations of proper touch, are none the less susceptible to exquisite sensations of this sort. These sensations are not confined to the surface of the body, its interior

portions being capable of exquisite suffering from pricking, cutting, and laceration. Hence this class of sensations seem, from their occasion or origin, to be more nearly allied to those sensations which we have called organic, and which are most conspicuous when an organ is injured or diseased.

The third class are sensations of temperature. These arise usually from contact of the body with some material object of different temperature from itself. They are also experienced by what is called radiation, from an object not in contact with the body. In such cases the body may be said to be in direct communication or contact with the heated atmosphere, or the vibrating medium of heat. The sensations of temperature are, in many particulars, like the painful sensations which we have just described. They are like them in that they are not confined to the surface. In case of scalding from water or steam, or of a severe burn from fire, or of violent internal inflammation, or of febrile excitement, their causes are purely internal, and the affections are organic. The sensitiveness of the body to heat and cold is not proportioned to its susceptibility to touch.

The fourth class are the sensations of *pressure* or *weight*. These, so far as they are definite and peculiar, are the slightly benumbed and painful feeling which a weight occasions when laid upon the hand or arm, when there is no muscular effort to sustain or resist the pressure. In such a case slight additions may be made to the bulk of the body imposed, without being perceived. If the same experiments are made upon the parts of the body which are more mobile—as upon the lips, when resistance and muscular effort is provoked and made necessary—minute differences will be perceived and appreciated. Accurate experiments of this kind were made by Weber, eliciting surprising results. Hence the so-called sensations of weight are very largely complex in their nature, being made up of muscular sensations.

The fifth class are the *muscular sensations*, which have been already sufficiently characterized. Not only do they enter very largely into the sensations of weight, but into all those sensations which require motion upon and application to the surface of the body which is touched. The sensations of the rough and smooth, of the adhesive and slippery, of the elastic and non-elastic, are of this character. According to the nicety with which these sensations are distinguished, is the delicacy of perception by touch. Success in any manual art depends upon this sort of nicety. Skill in sewing, engraving, and drawing, in the handling of tools, in driving, rowing, and playing on musical instruments, depends on the natural capacity for and the nice attention to these muscular sensations. They are equally, if not more important, to our judgments of form, size, distance, and the various relations of extension as we shall see in considering the acquired perceptions.

Sensations local-
ised.

One feature all these sensations share in common. Though sufficiently alike to be classed together as tactual, muscular, etc., etc., yet they differ in quality according to the part of the body which is their seat. The tactual sensations on the palm are different from those on the back of the hand; those on the hand are different from those on the different parts of the arm, and so on through every portion of the surface of the body. The same is true of the different muscular sensations. The muscular sensations which attend the opening and closing of one finger, differ from those which are experienced in opening and shutting the hand. Those which we feel in managing the arm differ from those which are used in controlling the position of the head. The same is true of the other classes of sensations which are appropriate to the interior of the trunk or the vital organs. This fact is of great importance in the explanation of the acquired perceptions.

Perceptions
proper of touch.

§ 129. From considering the sensational element in touch, we pass to the perceptive. By perception proper, in touch, as in the other senses, we apprehend objects as extended and external. To touch has been assigned especial superiority in these discriminations. Many limit them exclusively to touch, making it the only agent through which we perceive, and assigning to all the other senses the sensational function only. Others, as we have already said, limit perception proper to touch and sight. Our own view has been already defined. We hold that through every sensation, and of course in connection with every one of the senses, we perceive—i. e., we apprehend objects as extended and external. The perceptions of touch, however, differ from those of the other senses not only in being more definite and minute, in consequence of the greater energy of the sensations, but also (with the exception of sight) in their immeasurably superior variety. For this reason they deserve special consideration.

Extension and
externality per-
ceived in the
concrete.

Let it be observed as a preliminary, that what we perceive by touch, or any other sense, is not extension or externality in the abstract or the general, but only extended and external objects; or, more exactly, we perceive objects as external and extended. We do not, by touch alone, gain mathematical extension, nor mathematical qualities, nor the relations of pure mathematical quantities to one another, nor to the pure or abstract space or time which we conceive to exist. We simply perceive extended and external somethings. We afterward know them as having surfaces, as extended in different directions, as having different forms, sizes, and dimensions. Every object which we perceive has a definite extension of its own, and hence can be compared with another object in position, dimensions, form, etc., etc. But first of all, it is and must be known as an extended object, distinguished from the perceiving agent, and from every other extended object.

Perception of ex-
tension by touch.
Not explicable
by extension in
the organism.

It is contended by many that the reason why we perceive extension by touch, either exclusively, or in common with sight, is, that the organism itself is extended. We find, they say, that in those parts of the skin in which our perception of extension is the most definite and acute, the nerves and the nervous endings are most frequent; while in those portions in which its dimensions are most vaguely perceived, these are more sparse. Hence it is concluded that two nervous terminations at least are required for the apprehension of superficial extension. Moreover, it is urged that, as the remaining organs, except those of sight and touch, are each furnished with a single nerve only, or, at most, with a single pair, that is the sufficient reason why, by means of these,

we have no perception of extension. In touch and sight, it is said, the soul being affected by sensations through nerves placed side by side in space, must necessarily perceive objects as extended. Some contend that this is done as the soul is affected directly by the outer termini or extremes of the sentient nerves. Others hold that the inner extremities of the nerves, as they terminate in the brain or other nerve-centres, present spatial relations, similar to those of their outer extremities, and so enable the soul to perceive the extended objects of touch. The same explanation is given of the perception of extension by sight. This view is held chiefly by physiologists, and, among them, by the distinguished John Müller, with whom many others agree.

Physiological
conditions and
psychical act.

Of this theory we observe, that it overlooks entirely the difference between the physical conditions of perception and the act of perception. It may be, and probably is, a necessary condition to perceiving extension by touch and sight, that many nerves should terminate side by side in the organs, and be spread over an extended expanse. But it is one thing for the nervous apparatus to occupy an extended organ, and entirely another for the mind, by means, or on occasion of the sensations which follow the excitement of these nerves, to perceive an extended object. The impinging solid and the impinging light are both extended; the impinged skin or retina present a surface that is made up of nervous endings that are placed side by side. From the application of the one physical extension to the other—of the object to the organ—ensue the sensations of touch or sight, but the soul in its sensations does not feel that one or more nervous terminations are affected. For it is not aware that it has nerves at all, or that one or more are called into action. Nor is it aware that separate parts of its skin, or other organs, are thus affected. It knows neither nerves nor extended organs as organs. It takes note neither of the outer nor the inner terminations of its nerves, at the time when, or as the means by which, it apprehends an extended surface. The spatial arrangement of the nervous endings may be a physiological fact, but this fact cannot be applied to the explanation of the apprehension of extension as a psychical process. Moreover, this theory, and many others adopted by physiologists, involve the absurdity of making the soul first to know extension physiologically, in order to know extension psychologically—i. e., they require it to know the nerves as side by side, in order to know that very property which is essential to knowing an object as side by side with another.

Besides, if two nervous endings at the least are essential to conditionate the apprehension of an extended surface, then the affection of one alone is not sufficient. This is conceded by all the physiologists who take the view which we are now considering. But if the affection of a single nerve does not give extension, how can the affection of two or twenty? The placing of twenty lines side by side gives no breadth. Some contend that three at least must be called into action, of which the two outermost must be affected, and the one between be left inactive; the apprehension of a nerve in a state of inaction being supposed somehow to occasion perceived extension. But the sensation of the intermediate nerve in inaction is still a sensation, and the problem would be, how, by the combined sensations from three nerves side by side, neither of which gives extension by itself, to account for the perception of an extended surface.

Another theory of the physiologists is, that the perception of extension by touch and sight depends not on the knowledge of the spatial relations of the nerves, but on the diverse quality of the several sensations, both tactual and muscular, corresponding to the part of the body which is affected. To every part of the body, on the surface and through the interior, there is appropriated a certain quality and degree of sensation. When any number of these sensations are experienced, it is urged, these affections, experienced in their relation to one another, are the means by which extension is perceived. Single sensations, as such, experienced apart, give no relation of space; but several, experienced together, give extension. To this explanation the objection is fatal, which we have already adduced, that any number of sensations cannot, by the circumstance that they are experienced together, evolve any relation of extension, unless they give

Not by local
signs.

extension when experienced alone. No addition of zeros will make a unit; no multiplication of breadthless lines will give breadth; no experience of a number of extensionless sensations will suggest extension.

Lotze, the most eminent of the physiologists who adopt the theory of a diversity of sensations as local signs, himself asserts this, and expressly disclaims holding that the experience of diverse sensations originates the perception of extension or of space. He contends that space must be assumed as given, but that the office of the diverse sensations is to make definite and familiar the relations of the parts of the body to space. In other words, these diverse local sensations are the conditions of distinguishing relative position or place. Cf. I. H. Fichte, *Psychologie*, § 155-163.

One or two other theories, similar in their principle, and therefore refuted on similar grounds, might here be noticed, but we reserve the consideration of them for a more appropriate place. These, and those which we have discussed, are alike exposed to one fatal objection—that, even on their own showing, they can only explain the perception of superficial extension. Extension in the third dimension, they can in no way provide or account for. From all these theories, which fail to account for the acknowledged facts in our conscious experience, we return with greater confidence to our original statement, that sensations through every organ give perception, and in perception is involved the cognition of an extended object.

The sensorium
known as ex-
tended.

In the exercise of touch, the tactual and muscular and other more subjective sensations, are called into action. But these all pertain, and are known to pertain, to the soul as connected with an extended sensorium. This sensorium is known to the soul not as a collection of nerve-endings or nerve-expansions, not as having a defined inner content and limiting surface, but as found in various conditions of activity, involving the soul's own active sympathy of either suffering or enjoyment. All these sensations involve some relation of extension and place, very vague at first, but sure to be more positive and definite as soon as the soul fixes its attention upon each. These relations comprehend all the dimensions of space, as truly as any. The soul, as it were, occupies and pervades the sensorium as extended in all directions. Its attention is first fixed upon certain of the sensations that are most positive or energetic, especially upon the pleasurable and painful, the muscular and tactual. Then the local diversities and likenesses are noticed, and the relations of place within and upon the surface of the body become fixed. Differences in direction, form, size, etc., are fixed, by processes which we shall explain, under the acquired perceptions. But the condition of any of these processes is the assumption that in the original perceptions of touch, extension, or the extended sensorium, and this as extended in three dimensions, is directly perceived. But tangible objects are not only known as extended; they are also known as external. This brings us to our next division:

The perception
of externality by
touch.

§ 130. Externality, or outness, is involved in the extension which is known by the sensations of touch. Externality differs from simple diversity, or difference. Diversity may pertain to objects that are purely spiritual, as a series of mental activities

Two meanings of externality.

But externality as apprehended in perception, as has already been explained, is the diversity or distinguishability of an extended object from the spirit as non-spatial, and also the separateness or separableness of the material universe, or of material objects usually so-called, from the animated body. Both these relations are apprehended in sense-perception, and preëminently by the sense of touch. It is not only important, but essential, that these two meanings be not confounded.

It is also important to observe, that the externality which we perceive, is, like extension, not abstract, but concrete externality; or, in more familiar terms, an external object, or an object as external.

Externality in the first signification.

We will consider the two senses of externality in their order. *First*, we inquire, How does the soul, in touch, perceive its own body to be external to itself? We answer, as in our previous discussion,—precisely as it does through the other senses, by an immediate and inexplicable act of its own. It perceives directly its own body as a non-self or a non-*ego*—originally its own sensorium excited to sensation. We raise this question a second time in connection with the sense of touch, because it has been often urged that its sensations are peculiar in revealing *outness*, or externality.

Some—as Reid—contend that the simple sense of resistance or hardness, or that affection of the sensorium which every solid body occasions, directly *suggests* outness.

Dr. Thomas Brown teaches that all proper tactual sensations, like other sensations proper, are purely subjective and spiritual, without the suggestions of externality and extension, and that it is only through the muscular sensations that the knowledge of the non-*ego* is gained. 'We open the hand or the arm, as we have done in a score of previous instances, without striking against an object. All that we experience is a succession of purely subjective affections—affections simply and solely spiritual. But we strike against a wall, or other resisting medium, and we ask, What has caused this new sensation? We answer, it is not myself, for I have previously had, or rather produced, only a succession of spiritual states, in a series of muscular sensations. But here is a change. I have a sensation uncaused by myself, but caused by a being different from myself. There exists, therefore, a being not myself, and so I reach the non-*ego*, or externality.' To this solution or explanation there is this fatal objection, that to the suggestion of the non-*ego* there is required simply the experience of a single new sensation out of the accustomed order. To be sure, the sensation must be very distinct and positive; as when, for example, the hand is smartly struck against a rock. But it is not the character of the sensation as more or less positive which gives the inference; it is because it occurs out of the accustomed order; it is because, in place of the usual order of sensations, you have one that is new, that an external cause is required. This would require that you assume that the arm or hand should in every previous instance have been opened or stretched in precisely the same way. For, if there had been any diversity in the order—if, by any twist or jerk, a positively new sensation had been introduced without an external object—then an external cause would have been required, and a non-*ego* would have been accepted, when, in Brown's sense, there was none.

But allowing that the order of sensations has been previously the same, and that, by the resisting object, the order is for the first time changed, in what does the change consist? Simply in the introduction of a new subjective experience. The resisting object gives only a

novel sensation, which is still subjective. However unusual it may be, it is only subjective and psychical, and, according to Brown's theory, can give no relation of extension, and therefore no relation of externality. Though, in the way supposed, a cause other than the agent might be reached, it would be purely spiritual, and not necessarily spatial.

All these, and every other theory of the sort, have one common weakness—that they require us, by some arrangement or series or combination of sensations purely subjective, to account for or develop an objective, *i. e.*, an external non-*ego*. But it is obvious that it is not the greater or less positiveness of a subjective sensation, nor any change in the order of such sensations, which will elicit a non-*ego*, if it be not immediately discerned by the mind itself. The consideration of these theories brings us back with greater confidence to our original proposition, that the sense of touch is like the other senses, in that it gives the non-*ego* directly perceived, *viz.*, the sensorium aroused to its appropriate sensations.

Externality in
the second signi-
fication.

But what! it may be objected, when I grasp a pebble, or an ivory ball, or a stick, is all that I perceive as external to myself simply the sensorium excited by the object grasped? Is this the non-*ego* which I perceive, and this only? We reply, that this is the only non-*ego*, which we perceive by direct and original perception. But do we not perceive also the object which produces these sensations? Do we not directly perceive the surface of the pebble, the ball, or the stick, as diverse from the sensorium, and the body which it pervades? Not by immediate perception. If we did, it would involve the inference that we perceive a non-*ego*, *viz.*, the surface of the pebble as touched, and producing a sensation, *viz.*, the felt sensation, which is also a non-*ego*. That is, we should have immediate perception of two non-*egos*—the sensorium excited, and the object exciting it to a sensation. This is possible, but it must be shown to be necessary. We prefer the theory that externality in the *second* sense—*i. e.*, the distinction of the not-body from the body—is discerned not by an original, but by an acquired perception, as will be explained in its place (§ 155). It is the result, not of a single act, but of a series of processes. It is in connection with the sense of touch, as we shall show, that these processes are performed with especial advantage, and therefore it is to the sense of touch that the knowledge of outness in the second sense is preëminently to be referred. For these processes the sensations of touch are especially adapted, because of the energetic and easily distinguishable character of those tactual sensations of which the whole bodily surface is capable, and because of the variable pressure and mobility which the muscles conditionate.

Sense of touch,
the leading
sense.

§ 131. The sense of touch is the most positive of all the senses in the character of its sensations. In many respects it is worthy to be called the leading sense. The sensations which it gives, and those which are called into action in connection with it, are felt on every part of the surface, and throughout the interior of the body and all its members. The sensations themselves are the most energetic of any that we experience.

Moreover, the organ of every other sense is also an organ of touch,

and, as such, is more or less sensitive. We touch the food which we taste, and unless we touch it, we cannot taste it. Though the eye does not literally touch the undulating light—i. e., in response to the touch of light, it gives no tactual sensations—yet, when the surface of the eye is pressed by the finger, or strikes against any solid object, it feels, and is pained. It is also acutely sensitive at times as a touching organ. The inner surfaces of the nostrils and of the ear, like the outer surface of the body, are susceptible of tactual sensations. All of these organs are more or less completely provided with a muscular apparatus, by which they are moved, directed, accommodated, and made more attent for and subservient to their appropriate sensations. They are all capable of painful sensations from injury and inflammation, and from excessive or abnormal activity. The various sensations appropriate to the sense of touch are experienced in connection with those sensations which are the appropriate function to each separate organ. Hence the tactual and muscular sensations are very intimately connected with seeing, hearing, smelling, and tasting. In view of these considerations, it was said long ago, by Democritus, that ‘all the senses were modifications of the sense of touch.’ The importance of this truth will be made apparent when we consider the prominence of touch in the formation of the acquired perceptions.

In view of these facts, touch has been called, by some physiologists, *general sensibility*, or the power of *general sensibility*; and the four remaining senses have been called the *special senses*. Cf. Dalton, *Human Physiology*, Phil., 1866.

Furnishes intel-
tactual terms.

It ought not to surprise us to learn, that the sense of touch furnishes most of the terms for the intellectual acts and states. Sight itself is indebted to touch for many of its terms. We *take* or *apprehend* a meaning; we *hold* an opinion; we *comprehend* or *grasp* a train of thought or a course of reasoning; we *accept* a proposition. Especially does touch furnish the words for those acts of the intellect in which the feelings and the will have a share. The reason is obvious. We touch and handle objects in order familiarly to understand their properties and laws. What objects we touch, and how we touch or handle them, is determined very largely by our feelings, whether of curiosity or indifference, of love or dislike, of caution or boldness. All these feelings are expressed through acts appropriate to the sense of touch, or by the modes of using its principal organs. Hence the spiritual acts or states generally are expressed by terms and phrases primarily applied to this class of bodily activities.

§ 182. The *sense of sight* is the last which we are to consider. The *organ of vision* is the eye. The eye is a structure made like an optical instrument, and adapted to the refraction of light by a combination of lenses, and to the production, by this means, of a distinct miniature image of the object seen upon the retina

or the dark network of nerves which lines the inner chamber. This image can be seen in the eye of some animals if separated carefully from its socket, and divested of the sclerotic coating behind. The surface of the eye is small compared with that of the organ of touch, but it is susceptible of the readiest and most rapid motions, and of adjustments of position and direction, with little muscular effort, with just as little muscular sensation as is required for the discrimination and regulation of its motions. This susceptibility of easy and swift motion and adjustment is one of its most remarkable physical features, and is the condition of its marvellous superiority.

The *conditions of distinct vision* are a proper quantity of light, and the formation of a well-refracted image upon the retina. If the light is deficient or excessive in quantity or intensity, there can be no distinct vision. There is a particular distance for every eye, at which the most perfect vision of a near object can be attained. This distance varies considerably, from that of the so-called near-sighted, to that of the far-sighted. This variety of the distances required is found to be occasioned by a difference in the degree of the convexity in the lenses of the eyes of different persons, requiring a different focal distance for the object. The inability to see distinctly at a certain distance may be overcome, or in part remedied, by a constrained adjustment of the retina and one or both lenses, through certain muscles provided for the purpose. The muscular sensations experienced by the adjustment of the eye in the effort to discern objects not seen distinctly, are important *media* in forming and applying the acquired perceptions. In order that the vision by both eyes may be single—and it must be single to be distinct—the two axes must be steadily fixed upon the same point; and in order that they may be fixed, they must be inclined together. The muscular sensations, varying with the different adjustments of the two axes are important in the acquired perceptions or judgments of vision.

Function of the image on the retina. These conditions are completed or furnished when a distinct picture on the retina is formed. This leads us to consider *the function of the image on the retina*, or its relations to the act and the objects of vision. Concerning this there is confusion and error of opinion. The mind does not see the image on the retina. If it did, it must do this by means of another image, and so on *ad infinitum*. Nor does it perceive the image by a psychical act, knowing it to be an image on the retina. It does not know that there is a retina, till the anatomist or the optician brings the fact to notice. Nor does it know of nerves, or nervous endings, or nervous expansions, in the act of seeing. Nor can it be aware, in any other way, of the image as an image. That its formation is essential to the act of vision, we know by physiological researches, but not in psychical experience. Physiologically, we know that the one is necessary to the other. Psychically, we are not only not conscious of using it as a known means of the act of seeing, but we are conscious that we do not employ it as such an aid or means. If this were kept in mind, serious difficulties in the explanation of the process of vision would be set aside. For example, it has been often asked, How can we see objects upright, of which the images on the retina are

inverted? How can we see objects as single, whose images are double? The answer to questions like these, and the difficulties which they involve, is, that the mind does not use the image as a medium in the psychical act. It starts with it as given, setting off from the image as the last member or link in the series of physical conditions.

The act of vision as a sense-perception includes two elements, the *sensational* and the *perceptual*.

The sensations proper from light and colors are scarcely marked in our conscious experience as pleasurable or painful.

Hence they are feebly obtrusive. They rarely if ever attract the attention except when painful through disease in the eye or an excess of energy which induces abnormal action. In such cases we may say that it is not the proper sensations of sight which give pain, but the *organic sensations* arising from irregular physical stimuli. Some colors, however, seem to give a positive sensuous pleasure, as rich violet or purple; and a series of such colors, finely blended, occasions extreme satisfaction. But even in these cases the pleasure, so far as it is sensuous, seems to follow an exciting or soothing stimulus to the nervous system, rather than to arise from a positive and distinctively grateful sensation. So far as it is æsthetic, it is not sensuous at all. The pleasure from form and outline, as distinguished from color, is still less sensuous. These facts explain why it is that the sensations of vision are less definitely located in the sensorium, and why, when the eye is known as their agent, the percepts are so readily detached from the eye and projected before it. The equally unobtrusive and feebly positive character of the muscular sensations which are experienced in using the eye contributes to the same result.

Perception proper in vision. The object.

§ 133. What is *the object perceived*? The objects of vision are illuminated, shaded, and colored *visibilia*. When we call them objects, we do not intend that they are objects in the sense that they can be felt or handled, but that they are illuminated and colored *percepts*, set over against the soul by itself, and distinguished from itself by its own act of perception. The spectrum, as of a color refracted by the prism, or of a flame collected on a screen, is a real object of vision. So is the image that seems to lurk behind a mirror, or to lie in the depth of a glassy pool. The colored network that is projected before the closed vision is an object. In short, whatever the eye beholds is a visible percept. Moreover, what the eye perceives, and as the eye perceives it, is the sole object that is visible. This percept is always colored. When we say it is colored, we include, under color, light and shade. Darkness, even, is discerned by the eye only as the intensest and gravest of positive colors. When light and color are declared to be the appropriate objects of vision, no opinion is advanced respecting the nature of light or color as a physical agent or material. It is not the physical light or color, but the physiological resultant of this as it acts upon or with the sensorium, which we see; and this is all which we see.

This object is always extended. The colored percept is an extended object, and it cannot be apprehended as colored without being perceived as extended also. Brown (*Lectures*, 28, 9) insists most earnestly that the sensation of color is not originally experienced in connection with extension, and that we connect the two only because and by means of an oft-experienced and inveterate association. Dugald Stewart (*Elements*) sanctions this view. James Mill, and all the associationalists, must of necessity adopt this solution. The following suppositions refute the doctrine: If two or more bands of color were present to the infant which had never exercised touch, it must see them both at once; and, if it sees them both, it must see them as expanded or extended; otherwise it could not see them at all, nor the line of transition or separation between them. Or if a disc of red were presented in the midst of, and surrounded by, a field of yellow or blue, or if a bright band of red were painted so as to return as a circle upon itself, on a field of black, the band could not be traced by the eye without requiring that the eye should contemplate as an extended percept the included surface or disc of red.

This view of Brown, Stewart, and others, in respect to color, is only a special application of their theory of the sensations which we have already considered, § 113. Its untruth is made signal and striking by the extreme consequences to which it leads in the case of color. Our own view, supported by conscious experience, is, that every act of perception involves an extended object.

The object of vision is, however, an extended superficies only. By vision only, a sphere is perceived simply as a delicately-shaded circular disc. A cube is a flat surface with abruptly-shaded portions, bounded by converging lines. If we draw or paint from Nature, we do it on a surface perfectly flat or even. In order to do this with truth, we must first see the object, as without obtruding or receding portions. We must see every object as we should see it if we had no sense except original or direct vision. We must copy such as they appear to or are seen by the eye alone, and divest and clear them of all those properties which the mind supplies or adds to the object as simply seen. Indeed, in some visible objects certain of these original aspects are apparent and obtrusive. We cannot, with the utmost effort, see some objects as they are. When, for example, we stand at the end of a long street, the lines of houses, or of trees, or posts, approach one another till they nearly meet in a point. But they do not converge in fact; they are exactly parallel.

"The perception of solid form is entirely a matter of experience. We see nothing but flat colors; and it is only by a series of experiments that we find out that a stain of black or gray indicates the dark side of a solid substance, or that a faint hue indicates that the object in which it appears is far away. The whole technical power of painting depends on our recovery of what may be called the *innocence of the eye*; that is to say, of a sort of a childish perception of these flat stains of color merely as such, without consciousness of what they signify, as a blind man would see them if suddenly gifted with sight."—John Ruskin, *Elements of Drawing*, pp. 5 and 6. London, 1857.

Contrary view.
The stereoscope.

It has been insisted by some that the eye perceives more than superficial extension—that we discern by vision, *depth*, or the *third* dimension; that the eye, as it were, sees around a sphere, or along the receding sides of a cube. An appeal is confidently made to Wheatstone's discoveries in respect to binocular vision, and the application of the same in the stereoscope. Wheatstone, as is well known, discovered that every object, as a statue, a cube, or a house, when seen by the right eye only, presents more of the receding surface toward the right than when the same object is perceived by the left eye. The converse is true of similar portions of such objects when seen by the left eye alone. He caused these two views of objects as seen by each eye singly to be drawn and shaded exactly as they are perceived. He then presented each to its eye in the same plane and at such a distance that the converging axis of each eye should be easily directed to its appropriate object. He found, as the result, that the two objects were seen as one. For an instant the two seem to distract the vision, that vacillates between two objects and one. But as soon as the axes are steadied, and the converging gaze is fixed, they blend into one, and start forth from the background into the relief of a projecting figure. From this phenomenon it is argued, that, by the application of both eyes in vision, we perceive the third dimension—i. e., we see the receding surfaces of objects as receding, and not as on a plane. The conclusion very far outruns the data from which it is derived. The objects seen through the stereoscope are not in relief, but are in a superficies or plane. No third dimension exists, but the usual signs of its presence are so striking, that the mind leaps for the instant to the conclusion that they in fact exist. The experiment of the stereoscope is so far from confirming the view that the third dimension is actually seen, that it shows most decisively that it cannot be, by effecting an illusion which is well-nigh perfect, even though the object is drawn and actually seen upon a plane.

A single object
seen with two
eyes.

§ 134. The question has been very frequently and very earnestly discussed, 'How is it possible that the mind should apprehend but a single object by means of two eyes?' The question has been variously answered by physiologists. Some have insisted that one eye only is in fact used in the act of vision, the office of the second being to strengthen or reinforce the nervous or physiological action of the first. Others teach that the mind beholds two objects in fact, but passes so readily from the one to the other, as in effect to apprehend only one. Others have sought to solve the problem by tracing the impressions made upon the corresponding parts of each retina, through the corresponding nerves of each, to a common blending or meeting-place in the organism, where the two are fused into one. So far as these facts are purely physiological, if they are to throw any light on the psychical act or object, they must assume that the mind performs the act by a conscious recognition of the retina, or the nervous apparatus, which is not true.

The psychical act is occupied with a psychical object, which, as has been explained, is colored extension. It sometimes happens that, in consequence of a diseased or abnormal condition of the eye or its nervous apparatus, the mind perceives two objects, when it ought to perceive but one. How is this to be explained, and what light does the fact shed upon the relation of vision with one eye, to vision with two? We answer: In double vision the mind beholds two similar objects in two directions. Direction is a psychical element or relation of that extension and space which we assume to be *a priori* and necessary to sense-perception. That this happens by reason of a physiological derangement, we know; but how or why this should occasion this psychical result, cannot be explained, for the reasons already given. The

only plausible attempt at analysis is the following: 'In single vision two percepts are perceived in the same part of the field of view. They must necessarily coincide. If the one overlaps the other, the one must obscure or strengthen the other.' The case is not supposable, from the nature of the percept. Usually, the object seen by one eye, as it were, predominates and directs the knowing *ego* to construct both as one, through its interest in the interpretation of what the percept represents, rather than in the percept itself. The possibility of such an interpretation by the intellect will be better understood when we consider the acquired perceptions.

Original place of the visible percept. § 135. The question also suggests itself, Where, in relation to the retina or the eye, is it that the visible object [*i. e.*, the variously-colored plane or disc first apprehended] is placed in the original act of vision: is it in the retina itself, or in the front of the eye? or is it projected in space—say at the proper focal distance before the eye? The question, in all its forms, supposes greater or a more matured knowledge of space, distance, and position than the mind can possess when it begins to see. The act of vision alone—*i. e.*, as excited without the aid of touch—does not at once distinguish these relations, or direct the attention to the sensations which involve their recognition. The muscles of the eye play too easily, and the attendant sensations are too indefinite and indifferent, to allow us to suppose that the mind derives through them so distinct apprehensions of the optical sensorium as to separate from it the exciting object, even if we should allow that, by vision alone, it could gain any perception of the third dimension—*i. e.*, of distance. We shall see that it is by touch that we first gain definite and measured perceptions of this third dimension. Touch also, by its more positive and obtrusive muscular and tactual sensations, calls attention to the space discriminations which these sensations involve. There can be no doubt that in the order of development, so far as space relations are concerned, the eye first follows the hand, and afterward leads it.

Position, or place, as applied to perceived objects, is relative. It supposes some objects to be fixed as starting-points, and others as standards of measuring or estimating distance from them. None such can be definitely fixed and familiar before the *not-body* is distinguished from the body, and before the hand, the eye, and the parts of the external body have been fixed in their relative positions. The vague knowledge of extended matter which the sensorium give must first be made definite by a bounding outline; and the most familiar extra-organic objects must first be placed apart from one another, before the eye or the retina can be known as the instrument of vision, or either can be distinguished as the place or the seat of the sense-percept. Long before these cognitions are attained, the sense-percept seen by the eye will have been carried by the hand into the space without the body, and irrecoverably connected with its correspondent touch-percepta, in the way hereafter to be described (§§ 157-9).

Dignity of the eye. § 136. The superiority of the eye to the other senses is owing in part to the unobtrusive delicacy of its sensations. They do not occupy the attention and detain it from the object itself and its relations. The force and tension of the soul's activity are given to these. Vision is capable of far finer discriminations than touch. A hair of the diameter of .002 of an inch can be distinctly seen.

The eye can also pass from one object to another with a swiftness which none of the other organs can imitate. In so doing, it can place data at the service of the intellect as quickly as the intellect can use them, however rapid may be its movements. By its swift and wide-reaching motions it can imitate the slower and limited motions of the hand, drawing outlines, constructing figures, measuring distances, combining groups and elements, with surprising rapidity and truth. The cultivated eye sweeps across a landscape, and in an instant the mind computes the size and distance of its principal objects, and unites them together within a framework of mathematical relations. The minuteness of the observed distinctions, the vividness of the contrasts, the cheerfulness of the colors, the stimulus of the light, the sharpness of the outlines, enable the mind to hold fast its perceptions, to recall them vividly and at will, and to employ them for science, art, or practical life. The eye has always ranked as the noblest of the senses; and many of the words which describe the actions of the pure intellect, as to *see*, to *perceive*, to *discern*, are taken apparently from this sense, though perhaps all are finally to be traced to the sense of touch.

CHAPTER V.

THE ACQUIRED SENSE-PERCEPTIONS.

Thus far in our inquiries we have considered each of the senses singly. We have seen that by each of these we gain peculiar knowledge. We perceive sights only by the eye, and sounds only by the ear. In connection with these diverse objects, we apprehend certain relations common to all, viz., externality and extension. In other words, by each of the organs we experience a determinate sensation, and apprehend an object that is both extended, and also distinguishable from the sentient and perceiving mind. The relations under which these objects are known, are apprehended more distinctly through some of the senses than through others.

Sense-perceptions, original and acquired.

§ 137. But the range of our sense-perceptions is far wider than this. We early learn to use one sense in place of another, or of several, and to apply the knowledge which is given by one, in place of that which belongs to one or more of those which are unused. Thus, if I go into a darkened room and perceive a peculiar fragrance, I know and say there is a rose or a tuberose, in the apartment—though I can see or handle neither. By means of the odor, I am directed to the place where the flower is placed, till I grasp it with my hand. If I hear a sound, I know it is from a piano, a guitar, or the human voice, and I know the direction from which it comes, and from how great a distance. If I look at an iron that is at glowing white heat, I say, It *looks* hot—though heat is properly felt. So I look at a surface

of fine velvet, and say, How soft and smooth it looks; or at a rough and prickly brush, and, as I gaze at it, I almost feel its harshness in my creeping flesh.

The two classes of sense-perceptions thus characterized are *the original* and *the acquired*. They are thus defined: An original perception is one that is performed by a single sense, when exercised alone. Whatever the mind knows in this way, either of an object or of its relations, is known directly and by an original endowment of man. It is a pure work or operation of nature, and cannot be traced to art. An acquired perception is one which we gain by experience or exercise. We use the knowledge given directly by one sense, as the sign or evidence of the knowledge which we might, but do not, in this particular case, gain by another.

Importance of, and time of gaining, the acquired perceptions. § 138. *The importance* of the acquired perceptions is manifest from the greater frequency with which we bring them into use, and the confidence with which we rely on them, as well as from their greater convenience. Indeed, they very often enable us to gain information we could not easily obtain without them, and often not at all by a direct use of the appropriate sense. Thus, a man strikes with a hammer upon the head of a barrel, and knows in an instant whether it is full or empty, without the trouble of opening it. A surgeon applies his ear to the breast of his patient, and determines whether the lungs or heart are diseased, where, and how far. An architect, by a glance of the eye, sees whether the framing of a bridge or roof is safe; or he measures off the dimensions of its parts by the eye as accurately as he could by his hand, or an instrument.

The time when, many of the acquired perceptions are gained, is very early. The most important, and those which are universally applied, are made in infancy, at a period earlier than the memory can recall, and by processes which the memory cannot untwine, nor any subtle analysis easily resolve. Others, which are commenced in infancy, are perfected in youth and early manhood. Many are not complete till the senses, through age, begin to fail, and the attention becomes less energetic and agile. We begin the education of the senses in the earliest moments of infancy. The artist, the mechanic, the musician, and the observer of nature, never finish it, till the organs refuse to aid and to serve the observing mind.

Many of these acquisitions are made so early, that they cannot be distinguished from the original teachings of Nature. In very many, the process is performed so rapidly that it is difficult for us to believe that the mind goes through any process at all, the knowledge comes so simply and directly. Hence, the analysis of these subtle movements and their products is so exciting and instructive. To 'untwist the secret chains' which were wrought so nicely before we can remember, and by arts which we seek to imagine but cannot recall, fascinates us by the mystery of the problem, and challenges the utmost of our skill.

It is better that we begin with those which have been made within our memory, of which the stages and the means are within our view and at our command. We may afterward venture to unravel the more delicate tissues that have been wrought by the finer and more dexter

ous arts of infancy, in that early yet mysterious period when Heaven lies close about us, and seems to direct the movements of the soul.

In explaining these later operations, we must suppose the process of sense-perception to be so far complete as to have given us distinct objects—material things, as we call them—made up of the varied percepts appropriate to each of the senses; fixed or movable in space, possessed of varied qualities, as relations to space, and to one another and the percipient mind. But we may be allowed thus to anticipate the results of later inquiries, for the great advantage which it will give us in interpreting the unknown and the unfamiliar by the familiar and the known.

The acquired perceptions of smell. § 189. The acquired perceptions of *smell* and of *hearing* invite our first attention, because they can be most readily explained. Our first examples are of odors. We experience the sensations of smell, as from a lily or tuberose, from camphor or musk. We ascribe them to certain objects of given appearance and structure, without the use of the sight or the touch by which the appearance or structure is directly discerned. The ground of this confident knowledge is experience. There is no reason *a priori*, why the fragrance of the tuberose should not proceed from the lily, and the fragrance of the lily from the tuberose; no known cause why camphor and musk should not interchange their odors. We have simply learned by experience, that in all cases where the sensation is experienced, a certain object is present. This experience has ripened into a conviction so firm, that we connect the one with the other without hesitation, and act upon our belief without reflection.

The acquired perceptions of hearing. We do the same with *sounds*. We hear a sound, and believe that it comes from a bell. We hear another, and know it is from a drum; another still, and say, There goes a cart, or a coach. We stand upon a height; we make the ear attent, and listen for distant sounds: one is of the crowing cock, another of the axe of the woodman, another of a rifle-shot, another of a moving railway train, another of the cry of distress. Each of these sounds we ascribe to its appropriate object with positive certainty, on the ground of simple experience.

We not only learn in this way the objects which occasion smells and sounds, but we learn the place and direction of both. In a darkened room, or in a strange garden by night, we can tell whether the lily or the tuberose is near or far, and in what direction; whether we are near to, or remote from a bed of violets or of roses. This is especially true of sounds. We know whether a ringing bell is on our right, or on our left; whether it is high, or low; whether a military band is far, or near; whether it approaches, or recedes. That knowledge of this kind is founded on experience only, is obvious from the fact, that when the usual or the assumed conditions or occasions of our knowledge are changed, we are mistaken in respect to the place, direction, and distance of a sound, and that mistakes in respect to these lead to error in regard to the object which occasions it. The beating of our own hearts may be mistaken for a knocking at the door; the trampling of horses in a neighboring stable, and the cutting of wood in a neighboring cellar, may be thought to be within our own dwelling. The rattling of a cart on a bridge may be mistaken for distant thunder; the humming of a mosquito, for a distant cry

of alarm, or the sound of a trumpet. In such cases the sound must first be removed by our mistaken judgment to a great distance, in order that it may be ascribed to a false occasion.

We apply smells and sounds to a still wider range of objects. By smell, we determine the taste of articles of food, the presence of poison, or of potent medical or chemical ingredients, the constitution of an ore or an earth. By sound, we judge of the quantity or quality of the metal in a sonorous body, of the density of a wood, of the kind of stone, and the genuineness of a coin.

§ 140. The *acquired perceptions of sight* are still more numerous and interesting. These divide themselves into several classes. The *first* of these are the judgments of distance by size. If we know the real magnitude of an object, we judge how far distant it is by means of its apparent magnitude. If we hold any familiar object, as a globe two feet in diameter, near the eye, and then remove it slowly, it will dwindle away first to an inconsiderable ball, and then to a mere speck. If we know its real size, by its apparent magnitude we judge how far it is actually removed. So true is this, that from a magnitude that is falsely assumed, we mistake as to the real distance, and are as confident and as prompt in our mistaken perception as though the data and the inference were both correct.

Let a person look over the coping of a wall, or the ridge of an intervening building, and see only the spire of a miniature church—say of a bird-house—and believe it to be attached to a real church, and he will at once see it as a very distant spire. Or let him, under like circumstances, view a toy coach with all its appointments, and believe it to be a coach of ordinary size, and he will at once project it as far away as the diminished magnitude requires. In pure outline drawing, when no accessions of shading are added—as, for example, in the so-called etchings of Retzsch—distance is represented in part by diminished magnitude.

Second: We judge of magnitude by the assumed distance. When we have a full and distinct impression of the distance of objects, we see—*i. e.*, perceive—they in full size. We every day see men and other objects at long distances greatly diminished and dwarfed, and yet we do not perceive or judge them to be smaller than they really are. A lofty building viewed at a very great distance, or a tall ship far off at sea, will even seem loftier than when viewed from a position very near, from which the beholder looks upward, without distance and other aids by which to judge of their height. The most impressive judgments of the height of the loftiest mountains and edifices are gained by seeing them at a great distance over an intervening plain.

Third: If the magnitude is unknown, or not considered, we judge of distance by means of the intensity of the color, the sharpness of the outline, and the clearness or confusion of the distinguishable parts. For example, should we view, through a tube, several trees of the same species, as the elm, the maple, or the oak, removed at different distances from one another, the nearest would be known by its brighter green, its more sharply defined outline, and its more clearly distinguished leaves and branches. By these circumstances, designated technically as '*atmosphere*,' painters produce the effect of nearness or distance, with accessories of relative magnitude and of more or fewer intervening objects.

The traveller in Italy, especially when he goes directly from England, judges the mountains to be far nearer than they are in fact. The atmosphere is so much more transparent than that to which he is accustomed, as to bring out the outlines and face of the mountains so distinctly that he cannot believe them so distant as they are. There is now and then a fine day in autumn with us, on which the distant hills and rocks seem to come most startlingly near, and at times to hang over the valley in threatening proximity. By a double process of judgment, objects seen in a mist assume a gigantic size. The indistinctness of their outline forces the mind to judge them far removed; the distance is incorrectly interpreted, and then their apparent magnitude at such a distance forces us again to invest them with gigantic proportions. The illusion is greatly heightened, if the mist is so dense as to hide the ground between the observer and the object.

Judgments of size by other equidistant objects. We judge also of *the size of objects*, by *comparing them with other objects* which are or seem to be at equal distance from ourselves. If the size or distance of our standard of comparison is incorrectly taken, we misjudge altogether. Dr. Abercrombie (*Intellectual Powers*) tells us that, on going up Ludgate Hill toward the great door of St. Paul's, which was open, he took several persons, who were standing under the opening, to be children, whom he found, on coming up to them, to be full-grown men. The reason was, that he assumed the height of the door to be less than it really was, and, by this false standard, he misjudged the size of the persons who stood under it.

A striking illustration is related by Upham (*Elements of Mental Philosophy*) from the *Edinburgh Journal of Science*, No. vii., p. 90. Some defect being observed in the effect of a dioramic representation of Rochester Cathedral, an attendant undertook to remedy it by adjusting the canvas. As he passed his hand across the surface, it was observed to grow enormously large when it reached that part of the picture which represented the remotest part of the interior of the church. The hand, by the effect of the perspective, was first thrown back to the furthest extremity of the vista of receding pillars, and was then measured by the assumed size of the objects at the end. In this case there was a double judgment; first, the size of the objects which were employed as the standard was estimated by their distance as represented in the painting; and second, the hand was thrown very far back from the eye. Being judged by the estimated size of the objects thus enlarged, it was thought to be enormously large.

Influence of intermediate objects. Our *judgments of distance* vary according as there are more or fewer *intermediate* objects. Objects seen across the land seem further than objects at the same distance seen across the water. A given expanse of the sea is greatly enlarged to the eye when a score or two of vessels are anchored at different distances along its surface. A level meadow or prairie, with copses, trees, and dwellings interspersed, seems far more extended than without them. A salt marsh, when dotted with haystacks, seems wider than at the season when they are removed.

Intermediate objects, by affecting our judgments of distance, affect our *judgments of size*. The sun and moon appear larger when near the horizon than when toward the zenith. Through the influence of intervening objects and the dimming influence of the atmosphere, they are removed to

a greater distance, and then judged to be larger. The sky itself, for this reason, is not the half of a sphere, but a section, of which the height is shorter than half the base. The moon, rising from behind a wood, is greatly enlarged, because its disc is divided into several portions by the trunks or branches of the trees, by which its apparent size is measured. It is thus brought nearer than is usual, and then compared with familiar standards of size. The effect is heightened by the glare from the reflected light, which causes trees and moon to be blended into a common impression, and to stand in the same plane.

When the ordinary standards of judgment are withdrawn, and our accustomed processes cannot be applied, we are either greatly embarrassed, and even bewildered, or we fall into serious and amusing errors. Captain Parry says: "We had frequent occasion, in our walks on shore, to remark the deception which takes place in estimating the distance and magnitude of objects over an unvaried surface of snow. It was not uncommon for us to direct our steps toward what we took to be a large mass of stone at the distance of half a mile from us, but which we were able to take up in our hands after one minute's walk. This was more particularly the case when ascending the brow of the hill." The traveller in Switzerland finds it impossible to believe that the mountains are so high or so distant as he is told they are. He cannot trust his judgments in respect to either, because so few of his usual standards are at hand. So faulty and confused is his vision at times, that his feelings of awe and his sense of the sublime fail to do justice to the grandeur of the scenes.

Let any person closely observe and attempt to analyze his own processes in vision, and he will be surprised to find how small a portion he actually or accurately sees of very familiar objects, when they are viewed from a distance; how little he discerns with the eye, and how much he supplies by the mind. We look at a dwelling, and think we can distinguish and trace the windows and doors; we see a person, and are certain that we discern his form, his dress, his gait, and his features; but if we look more closely, we find that we see with far less accuracy, and see fewer separate parts or objects, than we had thought, and that we supply many elements that are wholly wanting, and complete many that are very defective to the bodily eye.

§ 141. By means of sight we acquire perceptions *appropriate*
 Judgments of form, etc., by sight *to the touch*. When we look at a sphere, we see by the eye only a circular disc, on which the transitions of color, or of light and shade, pass so finely into one another, that we know, if we grasp it with our hands, we shall feel it to be spherical in form. A sphere may be so skilfully painted in fresco on a flat surface, that we actually take it to be a sphere in fact. We often seem to see projecting statues, graduated mouldings, depressed panels, receding corridors, vaulted domes; and yet, as we approach, we find only a plane surface.

When the blind from birth are restored to sight, they come into a new world, of the *percepts* of which, and their relations to the *percepts* already familiar to their touch, they have had no previous knowledge. They must therefore go through a special discipline in order to connect the well-known objects of touch with the newly-acquired experiences of the eye. Thus the blind boy whose sight was restored by Cheselden could not call the cat and dog by their right names, or could not tell which was the cat and which was the dog. He could distinguish them, indeed, even by the eye, but he had not learned to connect the dog and cat as

handled—to the appropriate forms of which he had attached the names—with the dog and cat which he saw, so as to be able to *feel* them by means of his eyes. Finding himself, one day, at fault, he carefully felt of the cat with his hands, his eyes being shut, and set her down, exclaiming, “So, puss, I shall know you another time.” The question has been often asked (cf. Locke, *Essay*, B. ii. c. ix. § 8), whether a blind man, on being restored to sight, would know a cube from a sphere. It is obvious that, so far as mere vision is concerned, he could not but distinguish the two objects so soon as he attended to them with the eye. What he would need to acquire would be the capacity readily to connect the visible, with the tangible cube and sphere.

A very well educated blind man, who had reflected on his own intellectual processes, and had read somewhat in psychology, once observed to the writer, ‘I can imitate form by form, I can cut out and shape a dog in wood after a model which I can handle, but how it can be possible to represent form and relief upon a flat surface, as in painting and drawing, I cannot conceive. It is to me an inexplicable mystery.’

The process by which the blind just restored to sight connect the eye with the voice, is beautifully conceived in *King René's daughter* (New York, 1867), where Iolanthe recognises her father, *René*, and her lover, *Tristan*.

REN JAHIA (her physician): Arise, arise, my child, and look around.

IOLANTHE (the patient): Say, what are these, that bear such noble forms?

REN JAHIA: Thou know'st them all.

IOLANTHE: Ah, no; I can know nothing.

RENÉ (approaching IOLANTHE): Look on me, Iolanthe—me, thy father!

IOLANTHE (embracing him): My father! Oh, my God! Thou art my father!
I know thee now—thy voice, thy clasping hand.
Stay here! Be my protector—be my guide!
I am so strange here, in this world of light.
They've taken all that I possessed away—
All that in old time was thy daughter's joy.

RENÉ: I have cull'd out a guide for thee, my child.

IOLANTHE: Whom mean'st thou?

RENÉ (pointing to TRISTAN): See, he stands expecting thee.

IOLANTHE: The stranger yonder? Is he one of those
Bright cherubim thou once didst tell me of?
Is he the angel of the light come down?

RENÉ: Thou knowest him—hast spoken with him. Think!

IOLANTHE: With him? with him? (*holds her hands before the eyes*)
Father, I understand.
In yonder glorious form must surely dwell
The voice that late I heard—gentle, yet strong;
The one sole voice that lives in Nature's round.

(*To Tristan*) Oh, but one word of what thou saidst before!

TRISTAN: Oh, sweet and gracious lady!

IOLANTHE: List! oh, list!
With these dear words the light's benignant rays
Found out a way to me, and these sweet words
With my heart's warmth are intimately blent.

For an interesting memoir concerning James Mitchel, a youth who was both deaf and blind, see *Dugald Stewart, Elements*, vol. iii. app. For accounts of Laura Bridgman, a blind deaf-mute, see *Annual Reports of the Mass. Institution for the Blind*, by S. G. Howe. Also a memoir in *Smithsonian Contributions*, vol. ii., by F. Lieber. For accounts of Julia Brace, also a blind deaf-mute, see *Reports of the American Asylum*, Hartford, Conn.

Form, distance,
and magnitude:
how far learned
from touch.

§ 142. In the examples which have been cited, we translate the perceptions given by sight into those which are derived from touch. The proposition is sometimes broadly and positively laid down, that from the touch is derived all perception whatever of form, distance, and magnitude; inasmuch as in all cases, in the last analysis and as a final resort, we must come back to the touch as furnishing the ultimate standard. The position is sometimes stated thus: All visible extension must be reduced to that which is tangible. These propositions need to be somewhat qualified, if we hold that by the sight we perceive superficial extension. They are true to the letter of all those perceptions which involve the relation of depth, or the third dimension of space; but to all judgments of superficial form and dimensions they cannot literally apply. To the blind, however, it is true that touch furnishes the only possible standard of definite form, distance, and size.

The blind man applies his finger, his hand, or his arm, to every object which he encounters, and measures its size by these as standards. He measures length or distance also by the successive steps which he must take to reach objects that are remote. He uses his muscular sensations also to modify and complete many perceptions of form. But those who see, perceive objects extended superficially. Why, then, may they also not apply any of these objects as units of measurement, and as standards by which to judge of form and size? And why, when the mind has mastered, through touch, the third dimension of space, may not they, as the point of view is changed, be applied to measure this also? We reply, they may, and would do so always, if what is called the apparent magnitude of the standard, and of the objects to which it is applied, did not constantly change as these are near or remote. A yard-stick or a foot-rule may be so far removed from the eye, as to measure to the eye no more than a foot or an inch respectively. Even though the standard is unaltered by position, the object measured may, by being itself carried near or far, measure a foot, a yard, or a rod. It is only because we are certain that the standard and its objects coincide, that we are satisfied when we bring the rule to the surface of the object by the hand. But even then we use the eye, in order to be certain that the objects coincide. The hand of the blind, however surprising may be its delicacy of touch, can never attain the fineness of the eye in discerning the lines of coincidence. Give the practised eye an assurance that its distances are correctly taken, and it will measure and judge with marvellous accuracy. In very many instances the eye supplies or corrects what is defective to the hand, as truly as, in many others, the hand brings the eye to itself for the final adjustment of its wavering and uncertain movements. It is a circumstance which is worthy attention, and certainly ought not in this connection to be overlooked, that the point of distance from the eye at which vision, with most men, is most satisfactory, coincides with that at which the hand can most conveniently handle and hold an object.

The doctrine that in the original perceptions of vision the mind cannot perceive distance, has been denied by some able authors, particularly by Samuel Bailey, in his *Review of Berkeley's Theory of Vision*, London, 1842; and by Thomas K. Abbot, M.A. Trin. Coll. Dublin, in "*Sight and Touch, an attempt to disprove the received or (Berkeleyan) Theory of Vision.*" London, 1864. Both these writers urge their most plausible objections against the doctrine as Berkeley held it, some features of which have been abandoned by its recent defenders. Berkeley insisted (*Theory of Vision Vindicated and Explained*, MacMillan & Co., 1860) that we have no knowledge of extension in any of its dimensions by vision; that vision gives color only, and that there is no necessary connection between visible and tangible extension. All of these positions have been abandoned by most who adhere to his doctrine that the third dimension of extension is not the object of vision proper, but is inferred by its appropriate signs. Against this doctrine Abbot contends that sight and not touch "is the sense properly perceptive of distance or trinal extension." Abbot, however, does not himself hold, that the perception of the distance of an object is immediate, but that it is

effected by means of the varying sensations which attend the adjustments of th. eye. Distance a general, or space being given, i. e., without or beyond the eye, the mind, in his view, judges of the respective distances of visible objects by the delicate sensations which the eye experiences in adjusting its axes or its lenses—one or both—to the positions requisite for distinct vision. This is to make the original perceptions of distance to be judgments or inferences by signs, the signs being furnished by the eye itself. This in principle is coincident with one feature of Berkeley's theory, the difference being, that Abbot asserts that it is from the eye and not from touch, that these signs are originally furnished.

The only question now in dispute may be said to be this, Is the perception of distance by the eye original or acquired? is it the result of instinctive discernment or of rational judgment? It is not whether the assumption of space or trinal extension is required as the condition of externality to both mind and body, for this must be provided in some way or other, but it is whether the eye as eye, can see directly relative, i. e., concrete, extension in the third dimension? Upon this question Abbot takes both sides. In his analysis of the process of vision he denies. But, in the argument which he founds upon the observation of infants and the young of animals as well as of the cases of the blind restored to sight, he affirms.

§ 143. It is by the *acquired perceptions* that we definitely assign the places of *our sensations to the different parts of the body.*

All the sense-perceptions must be known to have some place in the sensorium (§ 114), though the limits of the place may not be definitely drawn, and the relative position of each perception may not be exactly fixed. We cannot believe, as we have already argued, that the sensations of sight, of hearing, of pain in the breast or in the teeth, could all be experienced together without being known to pertain to the extended sensorium, and, in some sense, to different parts of the same. Whatever is involved in such a perception, taken singly, is an original perception. Whatever is added or superinduced by combining several perceptions, is acquired by experience. For example: an adult person has a pain in one of his teeth, he does not know which—or a cut in a part of his arm, he does not know exactly where. If he touches the tooth with his tongue, or if he discovers in a mirror, which one is defective, he ascertains which is the one affected; he learns, as we say, where the pain is. In a similar way, by the eye, we fix the place of the cut in the arm. By processes similar to this, that is, by processes of combining subjective sensations—i. e., muscular and organic, with those of sight and touch as employed on the surface of the body—we learn to connect the one with the other, till we reach all the definiteness that is possible to be attained.

That much of this knowledge is acquired, is evident from some cases of lesion in different parts of the body, and of the loss of a limb by amputation. A man who has no foot, will feel pain in the foot. Why? Because he experiences precisely the same sensations which he suffered when he had the foot, and knew it was the seat of the pain. But if he had never had a foot, he would never have assigned pain to it; for he would never have had the means, by eye or hand or muscular sensations, of connecting these sensations with it. Some perceptions are far more definite than others. All those connected with the eye and the ear are confidently ascribed to their several organs; the subjective and vital perceptions it is often very difficult exactly to locate.

Acquired perceptions required to manage and control the body.

It is also by the acquired perceptions that we learn to regulate and control the movements of the body. Man was made to move. The first and most elementary activities of

his complex nature are manifested by bodily movements. When the soul, so to speak, finds the body, it finds it in motion. Not only is this true, but the body is, by its very structure, adapted to certain specific motions, as of walking, speaking, and singing, all having a precise and definite relation to either its present or its future wants or enjoyments. These bodily capacities the soul acquires the power to use in definite ways for specific ends. The motions to which nature prompts, the intellect learns to control and regulate, so as to bring to pass special and determinate results. This is done by acquiring the capacity to combine and connect various perceptions with certain efforts to move the body, which efforts are brought within its reach by the soul's own perceptions. This is a general statement of the facts and principles which relate to this subject. A more particular consideration of them requires the distinct consideration of two separate questions: What does nature provide or furnish? and how does the intellect apply these provisions or furnishings of Nature?

We ask, first: *What does nature provide?*

What does Nature provide in the construction and impulses of the body?

§ 144. We have already adverted to the fact (§ 108), that with the *sentient nerves*, which conditionate sensation, there are provided the *reflex motor*, which impel to motion. In obedience to the stimulus furnished by the one, there is awakened in the other an unbidden and often an uncontrollable tendency to motion. Consciousness need, and often does not, intervene. The motion will occur without her bidding, and often without her knowledge. Thus, we wink in response to the stimulus of light. Thus, the flesh quivers, and withdraws itself from the knife; the muscles knit themselves into convulsions and cramps. Under the same law, the excitements being diverse, the heart beats, the lungs expand, and other involuntary motions are performed. These functions and operations relate to the body, and their effects terminate in its well-being.

Arrangements and impulses for bodily expression.

There are other movements that are as truly involuntary and connatural, which the intellect has the power to apprehend and the will to control. Such are the muscular efforts that are involved in speaking, singing, and walking, or in feats of skill or dexterity. Many of these relate to the soul as well as to the body, in the way of use or enjoyment. Some of them are made ready for the spirit against the time when it shall be sufficiently developed to apply them with intelligence and design. To all these movements the stimulant comes not from without, but from within; not from the surface of the body, through the sentient inwardly, and back again along the reflex motor without, but by the direct action of some exciting force from within. When the infant weeps from pain, and laughs and shouts from delight, it is under the excitement proceeding directly from the soul, that the muscles are moved to laughter and to tears. In the same way, every emotion seeks and finds expression by attitudes, looks, and gestures. Let but the

soul feel wonder or surprise, and the face puts on a peculiar look, the frame adjusts itself to a given attitude, and the limbs are incited to appropriate gestures—i. e., the muscles obey nervous incitements from within, which produce these outward effects in the body.

In the same way is man prompted to speech : first to inarticulate cries expressing emotion only, and then to articulate language and words significant of definite thought. Nature provides for all this, by making man capable of a limited range of vocal sounds, through the action of those muscles that move the larynx ; and nature prompts to the use of these muscles in various ways, according to the varying excitements of feeling and thought. To very many, if not to all of these effects, the consentient action of many muscles is required. For this, Nature provides by so arranging the structure of the nerves through which these consentient muscles are excited, that, under the stimulus of feeling or thought, those needed, and those alone, shall be aroused to the united activities which conspire to the single effect.

Arrangements
for the combined
activity of differ-
ent parts.

Not only does nature provide for the conspiring action of several muscles to one effect, but she even arranges for and prompts to the combined action of different parts of the body, in obedience to a single impulse. In order to progress by walking, each leg must alternately advance before and wait for the other. To this alternate motion there is an original impulse. It is a movement which the infant makes long before it begins to walk. The arms, on the other hand, tend to move together. So do the fingers. It is difficult, and sometimes impossible, by any effort to bring certain of the fingers to a separate action. But it is in the eyes that this tendency to joint action is most conspicuous. The eyes will persistently move in the same direction together. They cannot be forced to act apart. One eye cannot by any violence be made to look upward while the other is directed downward. One will not tend to the right, and the other to the left.

Even more than this is true. There seems to be, so to speak, a natural aptitude for the joint action of organs that are not paired together, but which yet are fitted to aid each other in important uses. This is preëminently true of the eye and the hand. The eye must lead the hand, and the hand follow the eye, in a multitude of actions. When we would touch or grasp a small object at the first trial, the eye must guide. When we would strike it with a stick which we hold, or with a projectile, the eye must conspire with a fixed and earnest gaze. There must be some physical reason for this concurrent action of nerves and muscles connected with two organs, though it has not yet been discovered.

We ask, second : *How does the intellect apply what nature provides ?*

How does the In-
tellect avail itself
of these arrange-
ments ?

§ 145. The intellect finds itself furnished with this corporeal instrument, and actually using it under the promptings of nature ; it finds itself laughing, weeping, speaking, and walking, under the promptings of nature, and it acquires the power of directing these activities in particular methods and to certain definite results, and of doing this so readily, that it does not notice its own processes, or advert to the elements of which these processes consist. First, it observes the muscular sensations which are employed when certain

effects occur, and the effects it observes by the appropriate sense-perception. It experiments upon them, and notices how the sensations which are connected with the varying use of its muscles are connected with a varying effect. Then it tentatively and designedly repeats the effect which it has chanced to produce, or it seeks to imitate the effect which another has accomplished; *e. g.*, to utter a sound, to refrain from laughter or from weeping, to walk slowly or rapidly, or with a particular gait. By the repetition of the effort, the effect is produced without attention to the means, till at last the effect seems to occur without the use of these means at all. When the mind would accomplish an object, as utter a sound, hold a book, or let it fall, walk, run, or leap, it thinks only of the effect, and wills it, and it is done.

When we speak of the necessity that certain muscles should conspire to produce a particular result, and say that the required action is known to the mind by means of muscular sensations, it is not to be inferred that there is a special sensation appropriate to each separate muscle, and, of course, a special complex of sensations, corresponding to the particular set of muscles which are combined to the given result. That these sensations proceed from the muscles, is least of all known or noticed, inasmuch as the spirit has no direct cognizance of its muscles, and does not know how many it uses, or that it uses any, till the anatomist uncovers them by dissection. The sensation which indicates and guides to a designed effect may be simple or complex; it is sufficient that to each effect a definite sensation is assigned.

By means of such sensations the mind learns to produce these effects with readiness and precision. In learning the unfamiliar sounds or combinations of a foreign language, we try one experiment after another, till at last we succeed. When the ear is satisfied that the result is reached, we repeat the muscular effort required, guided by the muscular sensations, till our command over the organs is complete, and we can produce at will the sounds which we seek for. The infant pursues the same method in learning to talk. It is awakened from its purposeless lisping by the desire to produce a sound, as to pronounce a word, or brief sentence. At first it succeeds imperfectly, but well enough to guide its efforts in the direction toward complete success. It triumphs at last, and it attentively observes the sensation which is connected with the word which it has learned to speak. By producing these sensations, it can repeat the word or sentence a second time.

The deaf-mute cannot learn to speak, not because he is mute by reason of any defect in the organs of speech, but because he is deaf, and cannot guide them. He has the vocal apparatus in complete perfection. He can make all the varieties of vocal utterances which are required in speech. But not having the ear by which to direct his efforts, he can neither form his own efforts to definite results, nor can he keep the acquisitions which he has made. In a few cases, the deaf and dumb have been taught to articulate by a discipline specially directed to the management of the vocal apparatus; but the articulation is imperfect, and easily lost. A few striking cases are reported of persons who had lost their hearing in early childhood, and have yet retained the power of conversation, by reading the words of others on their lips, and uttering their own by the guidance of their remembered muscular sensations.

How we learn to talk.

But the articulation usually becomes degenerate and disagreeable, for lack of the correcting and refining guidance of the ear.

How we learn to walk.

The infant learns to walk as it learns to talk. It notices the sensations which attend those adjustments of the muscles which are necessary to quick or slow progress, to rising or sitting, to running or leaping. In all these effects we are usually guided by the eye. But sometimes we have not the eye to guide us. We ascend a flight of stairs to which we are accustomed, by a vague remembrance of the height and width of the steps. The blind depend on the guidance of others, both in their first essays and in many of the subsequent uses which they make of their limbs.

Occasionally it happens that a man is forced to learn to walk a second time. Upham (*Elements*, § 110) tells the story of a person whose spine was crushed under the wheels of a heavy vehicle, so as to disable him from the use of his legs for a long time. On his partial recovery, he found that, though his muscles were so far uninjured that they would move his limbs, yet he did not know how to regulate them. He could contract and expand his muscles in every possible motion, but he did not know which would advance, and which withdraw his limbs. The muscular sensations on which he had formerly relied were either no longer experienced, or they did not indicate the same motions as formerly. He was therefore forced, a second time, to go through the process of learning to connect new muscular sensations with the movements required.

Feats of dexterity. Expressional effects.

By similar processes dexterity is acquired in those uses of the limbs which are required in feats of dexterity, as in sleight of hand, or in playing on a musical instrument. By effort and repetition, new acquisitions may be gained which are more surprising than those movements for which nature provides an original tendency. It is to be observed, however, that whatever movements nature fails to provide for, she gracefully accepts as a second or additional endowment. The effort to constrain the organs or limbs to an unnatural position or adjustment, may at first be painful, and it may cost constant and severe application. But if it is persevered in, and especially if the intervals in which it is remitted are short, these new adjustments of the muscles are secured, and they even shape themselves to new forms under the nervous stimulus that is directed to them. Muscles and nerves that had never acted together before, conform to new harmonies. While the mind is renewing its efforts at brief intervals for a succession of months or years, the substance of the body, in obedience to the laws of life, is continually changing; and as it changes in material, it is also changed in form, under the moulding pressure of psychical tension.

In infancy and early childhood the merely physical capacity of receiving directions and impressions from within is incomparably more ready and quick than in later years. In early life, every single distinct effort in the use of any bodily organ seems to initiate a definite physical predisposition toward a permanent physical effect, either in the force or direction of the nervous stimulus, or in a new combination of muscles, or the fixing some form or attitude. A few repetitions, a brief perseverance, and the body is permanently moulded or fixed to this

special service of the soul, in some new attitude or habit. Hence it is that the bodily habits acquired in early life are so readily contracted and so inveterately retained. But whether the law acts with greater or less efficiency at an early or later period, the principle is the same. Certain muscles of the hand act together under some casual or intended impulse, and a character is given to the handwriting. Certain other combinations give a distinct individuality to the gait, the pose of the head, and the bearing of the man. New powers of expression are gained by the vocal organs for the purposes of elocution and music. Peculiar habits of speaking and of singing are assumed. The face becomes capable of expressing an additional number and variety of shades and moods of feeling. The exercise of severe and concentrated thought forms the features to a peculiar expression. Care and suffering write lines upon the brow. Noble and generous emotions, cherished and manifested, fix a spiritual impress upon the face. The indulgence of sensual and vicious passions form the muscles to a debased and animalized expression. Thus the body becomes spiritualized by the soul, which employs it in noble uses, or becomes literally imbruted by being degraded to the service of cunning, of indolence, and of shame.

Summary and inferences.

These many and various examples of the acquired perceptions have been adduced from all the senses in order to prove

conclusively that we use these perceptions constantly, without reflection, and usually without being aware that the process is mediate and indirect. They show, moreover, that the fact that the process is performed unconsciously does not prove in the least that the intellect does not perform a process. The ease, rapidity, and apparent directness of the movements of the mind are no valid proofs against the position that the mind, in all these cases, uses one perception as a sign of another. Nor do they hold at all, when urged against the more obscure and unremembered processes by which the infant makes its subtle acquisitions, forming those deft and dexterous habits which give it more than half its individuality, and weaving those associations which become more than a second nature.

§ 146. What are called *the errors of the senses* lie wholly within the sphere of the acquired perceptions. A person needs only to fall into a few of these mistakes to be convinced that they are mistakes of judgment only, and that, whether he errs or judges correctly, the process is a process of judgment or induction. When a man sees, as he says, a bent stick in the water, he judges that it is bent by what he sees; or, in other words, he judges by what he sees, that, if the stick is handled or otherwise tested by the sense of touch, it will be found to be crooked. And yet he seems to perceive by the eye that it is bent. So, when he looks into a kaleidoscope, and sees scores of brilliant objects arranged in symmetrical groups, he perceives them all by the eye, and can count their number, and does not doubt that he can grasp them all by the hand. It is common in such cases for a person to say that his senses deceive him. But the senses are not treacherous; they cannot deceive. It is the man who is deceived in the judgments which he pronounces, on the evidence which the senses furnish. He is simply hasty and premature in judging by the eye. He rashly connects, with what he sees by the eye, something which he believes with his mind. The bent

The errors of the senses explained.

stick is perceived when out of the water just as is a bent stick in the water in either case a judgment is pronounced—in the one case a judgment which is right, in the other a judgment which is wrong.

The muscular sensations of the fingers are also disturbed. We cross the fingers, and at the points of each a single pea is felt as two. The reason is that the convex surfaces, which as they are usually touched are interpreted as looking inward forming a single sphere, seem to look outward, and by the imagination are interpreted as requiring two, to complete them.

We commit similar errors in all our acquired perceptions. We judge wrongly of the origin, the place, and the distance of smells and sounds, when the ordinary criteria are not present, or some extraordinary circumstance is not noticed. So we make many hasty inferences in respect to the size, distance, and form of visible objects, either from the careless use of the senses themselves, which leads us to overlook some peculiarity of the object directly perceived, or from the limitations of our previous experience, which have failed to make us acquainted with some novel element, as the water which refracts the light, or the kaleidoscope which reflects and multiplies it into bright and symmetrical forms.

How distinguished from another class. This class of the so-called errors and deceptions of the senses ought to be sharply distinguished from another, which is caused by the physical conditions of the sensations themselves. Some men, for example, are color-blind—i. e., they see all objects in one uniform, dingy hue, instead of under the bright and diversified colors which are granted to the majority of men. Some men, through a disease of the stomach or liver, see every object tinged with yellow. It occasionally happens that a man is afflicted with double vision—seeing two objects in cases where other men see but one. Others see spectra, or visible images, having no tangible reality, and no reality at all except to the individual who beholds them. Others hear sounds, as of ringing in the ears, when there is no sonorous body, and no vibration of the atmosphere. All cases of this kind are not deceptions of the senses, for the objects perceived are the natural and legitimate product of the physical conditions that are present; these conditions being the physical excitants or stimuli and the sensorium excited, whether healthy or unhealthy, whether normal or abnormal.

Phenomena of this sort reveal the true nature of the sensational element in the original perceptions. As the so-called errors in the acquired perceptions call our attention to the real nature of these perceptions, proving them in all cases to be judgments by signs or evidence, so do these abnormal or irregular phenomena of the direct or original perceptions establish the fact beyond question, that the sensational element is a joint product of the physical agent, the so-called object, and the sensorium, or animated organism; that there is no sound without an ear, no sight without the eye, no touch without the hand, and that what is heard, seen, and touched, depends on the eye, the ear, and the hand, as truly as upon the object. If we revert to our original definition of knowledge as the apprehension of objects by their relations, we should say that the object-matter, the sensational element in the original sense-perceptions, may change according as its conditions are altered, but that the relations discerned by the perceptive act are always the same, the act itself being inconceivable and impossible without

them. So far as the speculative question of the veracity and trustworthiness of our power of knowledge is concerned, and the speculative-practical question of the grounds of our confidence in the testimony of the senses, both these are to be settled by the general principles which are fundamental to all the inductive processes. These principles will be considered in their appropriate place.

The acquired perceptions as acts of knowledge. § 147. The acquired perceptions differ from the original as kinds or forms of knowledge. Acts of original perception are acts of direct or immediate knowledge. In such acts the objects are present to the intellect, and the intellect knows directly that they are, and that they hold their appropriate relations. Acts of acquired perception are acts of mediate knowledge. In such acts it is by the medium or through the aid of another act of original perception, that the object is reached which is perceived by the act in question. Thus, when I know the occasion of an odor, the size or distance of an object seen, etc., etc., I use a direct or immediate perception as the medium through which I reach what I believe or know.

Again: an act of acquired perception requires for its fulfilment the representative power, in the form of fancy or memory. When the mind, on occasion of a direct perception, supplies that which it does not directly feel, or see, or measure, it must bring its object forth from what it has formerly experienced, either in the precise form of a previous perception, or of one that is similar or analogous. But the original perception apprehends its object directly.

Again: if the act of acquired perception rests upon the representing power or agency, it must involve the action of the associative power. At the experience of one odor, we think of a lily; at the experience of another, of the tuberose. At the sight of a distant moving object, no larger than a speck, we think of a man or a horse. What brings the form of a rose or a tuberose, the picture of a man or a horse, before my mind's eye on the occasion of these direct perceptions? We must anticipate our knowledge of the laws which govern the representative power, in order to answer—The laws of association (§ 238).

They involve induction. § 148. Every act of acquired perception is an act of induction. The mind does more than represent some picture or remembrance out of the stores of its past experience; it believes there is a real object corresponding to this picture. In so doing, it performs a process of induction. It judges, by the signs or indications which the original perceptions furnish, that there are existing objects which the other senses would find to exist should they make the trial. The process by which this belief is attained is variously named *inference*, *induction*, *judgment*, *interpretation*, etc. It is peculiar in this, that it knows by *media* or signs, and that it assumes that these signs always indicate the same accompaniments, and that the laws and operations of Nature are uniform in respect to the connections which are indicated (§ 468).

It may surprise many to learn that the processes employed in the acquired perceptions are processes of induction. Induction is usually conceived and described as a process which is appropriated to philosophical discovery, which requires wide generalization and profound reflection, and issues only in comprehensive principles and laws. A little reflection will satisfy any one, however, that the act of mind is the same with that performed in every one of the acquired perceptions. The difference between the two kinds of induction is not in the process, but in the materials upon and with which the mind performs them. But the acts, the fundamental assumptions, and the liability to error in both, are essentially the same.

Reasons why infants can make these inductions.

But it cannot be possible, it will be urged, that the perceptions which the infant so rapidly acquires, and which the most ignorant and unreflecting adult skilfully apply, are in their nature similar to those profound and daring acts by which the astronomer scales the heavens, and the naturalist penetrates and resolves the mysteries of the universe. The difficulties and objections which are expressed in this language can be most effectually set aside, if we notice the differences in the circumstances and conditions of the acts performed by the infant and the philosopher.

1. We notice that the infant employs its perceptions upon a very limited number of objects. The sensations which its own body gives are not very numerous, whether they be muscular or external. Certainly those to which the attention is at first directed are but few, and these are vaguely and rudely perceived, and as vaguely recalled. It is not till the attention is disciplined and matured, and only just as fast as this happens, that it finds in the body within and the world without an infinitude of distinguishable objects, ever presenting themselves to be noticed as fast as the attentive mind is applied to observe them.

2. The few objects which the infant mind distinguishes are constantly recurring to view. The perceptions of the body within, and of the sense-world without, just as fast as they are perceived and mastered, and become distinct objects, return constantly to the view. Almost every hour brings back to the infant the whole world of its known objects—the whole of the universe, so far as explored by itself. All the acts which it has occasion to perform, involving special subjective or muscular sensations, will return again and again, perhaps a thousand times a day, filling up the whole horizon of its active exertions, ever recurring till some acquisition is made or some feat is successfully performed.

3. All the objects and parts of objects with which the infant has to do—in other words, all its sense-perceptions—have an immediate relation to its appetites and desires. To say nothing of the inextinguishable and unsated curiosity which stimulates the attention, and puts the soul upon every experiment which it is capable of performing, most of the objects which the infant observes are those which appeal directly to some present gratification. The child desires to walk, to reach, to stand, and its whole soul is absorbed in the effort to perform these feats. So, too, when it sees an object, that, as a visible percept, attracts the eye; if it handles it as well, and grasps or tries to hold it, the satisfaction to the eye is coupled with the gratification to the hand, and every muscular movement that disappoints or gives success is likely to be noticed by reason of its near relation to its wants and longings. In one word, the infant acquires the most of its secondary perceptions as a means to some pressing desire or urgent necessity, which is fitted to arouse and fix the attention.

4. When any experiment has been successfully made in the way of connecting the known and the untried, the gratification at success will stimulate to repetition: and this again holds the attention to every element and step in the process, till the whole is fixed in the memory. The infant repeats all its lessons as fast as it learns them, because it rejoices over its acquisitions.

5. The associating power unites what observation notices. So few are the combinations which it has made as yet, and so closely were they connected by the original act which first bound them together, that the one cannot be perceived or thought of without its companion. Not only, then, are the objects with which the infant has to do, few in the comparison, and therefore constantly before the mind, but the associations by which they are connected will

tend constantly to reproduce themselves. If, for example, an infant has observed that what is a shaded disc to the eye, is a spherical surface to the hand, the shaded disc will always remind it of the spherical surface. It cannot see the one without thinking of the other.

6. The resemblances which the infant apprehends are few, and discerned with little effort. It might better be said that similar objects are at first recognized as the *same*, rather than discerned as similar. Hence the inductions of the infant are at first simple acts of spontaneous memory, rather than beliefs founded on similar instances. The infant, in observing objects that are alike, whether within or without its own body, seems quite as much to be repeating its own past experience, as performing acts and viewing objects that are like those with which it has before been occupied.

In induction proper, the similarities are remote—not obvious, not directly discerned, but indirectly surmised; the data themselves are the results of previous research and reflection, instead of being forced upon the attention.

7. The infant cares for the result, and, in its eagerness to reach it, slights or disregards the means. What it finds to be true, occupies its attention, and not the evidence or data by which it finds it. For example: if it judges that an object is spherical, all its attention and interest are expended upon the question, What is the shape? and none at all upon whether it is by the shaded disc, or some other medium, that its shape is ascertained. So, too, if the question comes up, What is that which I see—is it a man or a child, a house or a barn, a long stretch of road or an upright triangular plane? or, How far off? how large? etc., etc.—the mind is wholly intent upon the answers, and does not dwell at all upon the grounds on which it judges, as to what it is, or how large, or how far distant. It takes, and acts upon the result, without a thought of the process by which it was reached.

This habit is furthered by the entire inaptitude of the infant to reflect on its own subjective processes, and to analyze them into their elements. The infant is, as we say, unconscious of what it does; it does not reflect on the steps by which it proceeds to a conclusion; that of which it is the least aware is the ground of its belief or knowledge. It judges and reasons on appropriate evidence, and with sufficient grounds, but often it is aware only that it is certain that something is true, and not at all conscious of the grounds on which it became certain. It exercises its powers without reflecting upon them, or knowing that it performs a process at all.

8. The freshness and energy of the activity of the human soul in the earliest periods of its life continually surprise and astonish us. The activities of the intellect, the freshness of interest, the energy of will, the eagerness of the desires, the variety of the experiments upon itself, upon nature, and man, are always occasions of interest and surprise to older persons whose powers are torpid or overwrought, and whose curiosity is partially sated.

Whatever objections may be urged against the possibility that acquisitions like these should be made in infancy and early life, are satisfactorily met by the unquestioned fact, that the infant is constantly making experiments and falling into errors in this very sphere of induction and acquired knowledge. It makes awkward attempts to grasp, to reach, to stand, and to walk; it misjudges in respect to the distance, form, and size, and nature of objects beyond its reach; it is taught by experience, and it applies the lessons which experience imparts, whether painful or pleasant. It is never so busy as in the earliest years of its life. All this while it is chiefly occupied with experiments upon the material world and its own bodily powers, all its energy being employed in the very direction, and being busied with the very objects, with which the acquired perceptions are concerned.

It ought also to be remembered that, during the same period, it makes the surprising acquisition of language; always of the mother-tongue, and if circumstances favor, of one or two languages more. To acquire a new language so as to speak it well, costs an adult, whose powers are well-disciplined, many months, if not years of labor. With how much greater ease, rapidity, and perfection, is the same task achieved by the infant! Surely it is not so surprising that at an age as early, or even earlier, it should master the acquired perceptions. That it does not remember the processes through which it has gone, proves nothing concerning the question whether they were in fact gone over. We do not remember one of the thousand processes through which we must have passed in learning to talk. And yet the thought or the want suggests the word, which rushes to the tongue as if by instinct or inspiration; just as we judge of properties, size, and distance, without reflecting that we judge.

§ 149. It might be urged in objection still further, that there is no evidence that animals acquire any perceptions. On the contrary, observation shows decisively that they perceive directly the distance, size, and properties of the objects with which they are concerned. The chicken, with the young of certain birds, strikes its beak with precision and success at the food brought within its reach, even before it is released from the shell. The young of the partridge and the grouse run swiftly through the stubble, avoiding projecting objects as if with practised skill. The young of quadrupeds run and leap with no previous discipline or training. In view of these facts, it is confidently urged that, if these animals are taught by instinct to perceive correctly, it is not to be supposed that man would be left to the slow and uncertain processes of feeling his way along to certain belief. Surely Nature would do as much for its noblest work, as for the inferior species. See Adam Smith, *Essays of the External Senses*; Sir William Hamilton, *Met. Lec.*, 28; J. K. Abbot, *Sight and Touch*, c. xi.; S. Bailey, *Review of Berkeley's Theory*, c. v. sec. 1.

To this objection is to be opposed the indisputable fact, that the human species is trained to feel its way on to matured and trustworthy acquisitions. The reason why, is obvious. The animal has not the capacity to judge by signs, to that extent and with that discrimination which would qualify it to build up the power of perception. This deficiency is supplemented by instinct, about which we know but little, but know enough to be certain that it effects by blind and unintelligent impulse what reason discerns and performs of itself.

Man is indeed furnished with instincts, so far as he needs them, to impel and direct his movements, before his intellect is developed, or with respect to objects of which the intellect takes no cognizance. Instinct is a blind, unconscious force; it is not knowledge. An instinct cannot discern color or hear a sound; much less can it by the eye discern extension, or oneness, or shape, or size. These are discerned by acts of knowledge, and it is for the philoso-

pher to decide how much of this knowledge is gained by direct and intuitive perception, and how much by judgment. That question can only be answered by the observation of facts within the range of human experience, and by analogy, when the phenomena are removed from direct inspection, or have escaped our memory.

Some facts are observed in infants which are supposed to be inconsistent with these conclusions, and to prove decisively that the infant, as well as the animal, has some so-called 'instinctive perception' of distance. Thus, for example, Adam Smith reasons: "A child that is scarcely a month old, stretches out its hands to feel any little plaything that is presented toward it." It is more than possible that in infancy the eye cannot be excited by a visible object, especially if the object gives pleasure, without a consentient movement of the hands, and of both hands and eyes, in the same direction. That some provision should be made for such a conspiring movement or impulse to motion of two members of the body that perform many functions in common, may be received as probable, and believed to be true. But this would not prove that the eye, in the proper sense of the term, discerns distance. All the movements with both hand and eye show that this is judged or inferred by indications or signs.

Reasons why the perceptions of animals and of man should differ.

Important reasons suggest themselves, however, why the animal is taught and impelled by instinct to do at once, and with little exposure to failure, what man can only attain by slow and painful acquisition, and at the risk of many failures and sufferings. The discipline to which man is subjected has respect to his moral culture as well as to his intellectual perfection and success. He needs to learn patience, caution, foresight, self-distrust, and circumspection, as well as the higher virtues. All of these are furthered by the processes through which he must pass in gaining the acquired perceptions. It is by the adaptation of this discipline to high moral uses, that is explained the law of nature by which man is born the most ignorant and helpless of all the animals, and forced, as it were, to make his acquisitions by his own sagacity, as fast as he is impelled by the appetites, desires, and affections which are evoked from his at first undeveloped soul.

We may conclude, then, that the processes of the acquired perceptions are processes of induction, and that they involve the as yet unconsidered powers of representation, with association, and judgment by signs or indications. In other words, in the very act of perception, usually considered as the lowest and the most elementary of all the acts of the intellect, there is required the agency of the intuitions and relations which point to, and are involved in the very highest capacities of intelligence. This is a striking instance of the principle enounced at the outset, that no faculty of the intellect can act apart from the rest. We have found that, in the very lowest of all, the rudimentary action of the very highest must be present, in order that the act may be human and rational.

CHAPTER VI.

DEVELOPMENT AND GROWTH OF SENSE-PERCEPTION.

We have considered what is essential to sense-perception as an original act of the soul, and how it is that the soul acquires the power and skill to use one perception in place of another. The first of these powers is an original endowment; the second is a developed capacity. The examples of the development of this power which we have considered all occur under our direct observation. Experience is a decisive witness that the ability to make these combinations is acquired by every human being, by processes which we can more or less distinctly analyze. The exercise of this power involves all the constituents of induction.

Nature, interest,
and difficulty of
the problem.

§ 150. We propose next to treat of the acquisitions which are made before we can observe so as to remember; *i. e.*, to trace the growth and development of the sense-perceptions in earliest infancy. We take our guidance from what we have observed of those processes which we are certain that we acquire, and, going back to that period of which memory brings no report, we ask, From what beginnings, in what order, and by what steps does the infant mind develop and mature the power of sense-perception of which it finds itself in possession, when it awakes to distinct and remembered consciousness?

The problem is full of interest. It seems like a proposal to revive the experience of our earliest years, to restore, as it were, the forgotten past of our lives—the period when our curiosity was eager, our energy unabated, our hopes were boundless, and the universe was beckoning to us to explore and enjoy its infinitude. There is a mystery about those months and years which we would fain unravel, which tempts and tantalizes us because of its apparent darkness and obscurity. The difficulty and apparent insuperableness of the problem incite and challenge us to make the effort to follow the successive acts by which we ‘build up the being which we are.’

The difficulty which attends the effort arises from the fact that it is impossible, by memory, to bring back a single fragment of our infant life. We cannot penetrate the darkness and obscurity which overhang this entire period of our existence. Could we revive but a single isolated portion, one sole and separate act or state, when our perceptive power was yet rudimental, it would give us a clue by which to thread our way backward through this entangled maze, till we had reached the simple elements with which we began; or, returning upon our steps, we could combine these elements in the order of their actual accretion and growth.

Who can tell what a baby thinks?
 Who can follow the gossamer links
 By which the manikin feels his way
 Out from the shore of the great unknown,
 Blind, and wailing, and alone,
 Into the light of day?
 * * * * *
 What does he think of his mother's eyes?
 What does he think of his mother's hair?
 What of the cradle-roof, that flies
 Forward and backward through the air?
 What does he think of his mother's breast—
 Bare and beautiful, smooth and white—
 Seeking it ever with fresh delight—
 Cup of his life and couch of his rest?
 What does he think when her quick embrace
 Presses his hand, and buries his face,
 Deep where the heart-throbs sink and swell,
 With a tenderness she ne'er can tell? etc.

J. G. HOLLAND.—*Biller-Sweet.*

The problem perplexing to the imagination, but not insolvable to the intellect.

§ 151. But the problem, though difficult, is not insolvable. To the judgment only is it explicable, but not to the imagination. We can demonstrate what our infant life *must have been*, but we cannot imagine how this infant life *must have seemed*. We cannot expect to recall to the memory any actual experience of our own, when all visible objects were depicted on an extended plane, without distance or depth. Nor can we, by imagination, feign such an experience. The effort to do either must be fruitless. The new elements which we have incorporated with our constant habitudes of perception and knowledge we can never throw off. We cannot divest ourselves of the new growth which has overgrown the original germ. We must not expect, by any analysis, to restore the distinct experience of our infant perceptions, any more than we can a second time make real and rational the feelings of our infancy. No man can imagine himself to be a child, for the simple reason that in all things he must think and feel as a man.

To attempt to retrace and thus to reconstruct the processes of the earliest perceptions of childhood, is not irrational. We have at our command the materials with which to prosecute our analysis and to construct our synthesis. These are the known facts of experience and observation within our conscious experience, the facts observed of infants and very young children, and the probable conclusions which analogy warrants us in deriving from both.

Data and grounds of inference.

The facts which are established by our own observation in respect to the grounds and the processes of the perceptions which we know to be acquired, the exposure to constant mistakes in these perceptions, and the invalid plausibility of the objections which may be urged against these demonstrated facts, are all pertinent, and most of them decisive, when applied to the theories which we form of infantile development. We are justified in applying to the unknown the explanations which reason forces us to accept in respect to the known

All that we observe of the actions of infants and young children is entirely consistent with the theory, that they develop the power of perception by many experiments and many mistakes. Their experiments and errors can only be explained in consistency with this view.

The known methods and laws of nature in the education of men and of animals give the strongest confirmation to these conclusions. We rely with confidence upon the view that, so far as it is possible to account for the acquired perceptions by the theory of intelligent activity rather than by that of blind instinct, so far we are bound to go. Where intelligent activity cannot be presumed or proved, there instinct and intuition must be assumed.

Synthesis and *combination*, however, cannot account for every process or solve every problem. There must be original elements with which to begin, or else there would be nothing with which to combine, or which could be added when it was sought for. There must also be capacities or powers of original knowledge, beyond or behind which we cannot go in our analysis; which capacities, indeed, give the elements which we evolve by analysis. Otherwise the problem would be—given the power to know nothing by original activity, show how every thing can be known by the simple force of combination or substitution, with nothing to combine or substitute.

To this extreme the advocates of the associational psychology are continually driven in their efforts to explain by a single law our knowledge and beliefs—our knowledge of time, space, of the laws of matter and of spirit, of the very principles of induction, and of all necessary truths, even the very powers and passions of the soul. They would generate ‘inseparable associations;’ but *from what*, they do not so satisfactorily show (§ 48).

The intellect and soul before sense-perception begins.

§ 152. These things being premised, we observe: The first condition in which the soul may be supposed to exist before the beginnings of conscious activity is nearly allied to that of sleep undisturbed by dreams, or of extreme faintness, in which the most indistinct and feeblest sensations possible are experienced, without distinct perception. “*In Schlafes Armen wird das Kind zur Welt geboren.*” (A. Helfferich.) These states approach most nearly to what we may suppose to be the elementary condition of the soul, with this difference, however, that we carry into the sleep and faintness of adult years some dim and disturbing images from our waking consciousness. The undeveloped condition of man is not chaotic in the sense of being confused, disturbed, or bewildered; it is rather in that vague and low condition of sense-perception which comes from the activity of those muscular and vital sensations which belong to the processes of the animal life. These sensations, when closely attended to in later knowledge, are at best but vaguely and indefinitely conceived; and when they fill up the whole world of our conscious life, they must be obscure indeed. The activities to which these sensations excite are the result of the reflex actions of the nervous organism, and of those vital and animal instincts which are as blind and unintelligent.

The beginnings and development of attention.

From this condition the soul is aroused when it begins to attend either to its sensational condition, or to the responsive perceptual act. The soul scarcely can be said to have sensations even, till it is conscious of some sharp or positive experience of

pain or pleasure. Much less can it be said to perceive, till its attention is aroused, repeated, and fixed upon some single sensible *percept*.

We are not to suppose that the attention, in either of these directions, is developed as a single bound, or that its energy is attained by one spasm of effort; nor that the soul maintains itself always in the attent condition which it at first occasionally attains. All analogies from the states of our mature experience would lead us to believe that the soul now rises into a moment's fixed attention, and then sinks again to blank inattention. Again, it is roused a second time by some earnest and intruding solicitation, attends for an instant, and relapses a second time into the merely instinctive life.

Nor, again, are we to believe that the attention can only be aroused or occupied by a single sense at once, or that, consequently, it is by successive energizings of each sense and each object taken one by one, that the several powers of sense-perception are distinctly developed and matured. On the other hand, it is far more rational to believe that contrast stimulates attention, and that attention is truly and eminently discrimination, holding the mind to one object as necessary to distinguish it from another, and sending it back to the second object from which it was distinguished, by reaction from the very effort with which it gave itself to the first.

This view of attention is conformed entirely to the law of its movements within our experience, and it makes it much easier to comprehend how the several senses may be developed together, and how the objects appropriate to each may readily blend into one.

§ 153. The sense-perceptions which are first developed are

Muscular and vital perceptions first developed.

doubtless the muscular and vital. If, however, we perceive only so far as we attend, it may be doubtful whether we ought to call them sense-perceptions till they are connected with those perceptions which are more positive and objective, as the perceptions of sight and touch, by connection with which they render their most important service as perceptions.

We should expect, for certain reasons, that the three senses of hearing, taste, and smell, would spring into activity next in order, as being nearest akin to the first and as requiring a less persistent and a less intellectual effort. Observation does not, however, confirm these anticipations. The sense of hearing is used, in some feeble degree, a few days after birth, scarcely in such a manner or degree as to be called attentive or discriminating. The sense of taste is still later. At first, the infant swallows medicine as readily as milk. It is not till some four weeks have elapsed that it distinguishes the one from the other. Later still is exercised the sense of smell. *Kussmaul* says taste and smell are active from the first. Hearing only is feebly developed. Hearing remains the longest, as death comes on.

Hearing, taste, and smell.

These facts, furnished by observation, when regarded from another point of view seem less surprising. These sense-perceptions of themselves are of little service. They can be applied to no use, either of science or curiosity, till they are connected with the objects which excite them, and indicate some property or relation. It is consistent with the economy of nature that they should not be called into action till the time of their useful activity has come. Till then, the capacity for their exercise is simply dormant and undeveloped. (Cf

Loebisch, *Die Seele des Kindes in ihren Entwicklungen*, 2 Aufl., Wien, 1884; also Kussmaul *Untersuchungen über das Seelenleben des neugeborenen Menschen*, Leipzig, 1859.)

The eye and the hand: which acts first? § 154. It is *with the eye and the hand* that the soul begins fixedly to attend, and, of course, effectively to perceive. But with which does it first begin—with the eye, or with the hand? It is impossible to answer. Perhaps it were safer and more exact to say that it begins with neither alone, but with both—i. e., each aids the other, till, by the help of both combined, the mind reaches the distinct perception of external and spatial objects.

We begin with the hand, and the sense of touch as the sense of which no human being can possibly be deprived. Whatever may be true of the eye, we are certain that intelligent perception by touch must be acquired very early.

To the blind, these perceptions must always take the place of the perceptions of sight. To the blind, they must give the perceptions of the world of matter as separate from and external to the animated body, as also the various relations of extension and space. If it be supposed that touch is normally developed before sight begins to be matured, then every human being must learn to perceive for a while as though he were blind. He must learn to combine the acquired perceptions, as a blind man always does. When sight awakes, it is simply to aid and facilitate the process, by giving it greater rapidity and precision.

We begin with the hand. We begin, then, with touch. Our problem is, to show how, by touch, we acquire the perception of extension and of outness or externality—by which we mean separableness from the body; or the not-body. We have before assumed that, by original perception, we do through each of the senses distinguish the body from the spirit, and also know the sense-percept itself as spatial. These relations being given to touch as an original power, it remains for us to ask how we *learn* by touch to separate the not-body from the body, and how we learn the relations of this not-body to space. It is to be remembered, that what we know by original perception is that non-*ego*, which is distinguished from the sentient *ego*, or the *ego* which animates the sensorium. We are now to inquire into the process by which the knowledge of the non-*ego* as the *not-body*, is attained.

Extra-organic non-ego; how perceived. § 155. First: We acquire the knowledge of the not-body by contrasting the muscular and tactual perceptions. The muscular and tactual perceptions we suppose to be familiarly known. By means of the distinguished muscular sensations we perceive the interior of the body which the spirit inhabits and controls. We know its interior parts through the vague but real sensations which are experienced in the use of the various muscles and the action of the several vital organs. But as yet we know no exterior world. Even when we touch what are afterwards discovered to be material objects, we have only the tactual perceptions which ensue on the application of the skin to whatever the object may be. When the infant lays its hand on a flat and

smooth surface, it perceives a portion of its own body in a given state of activity. If the surface is triangular, a corresponding portion of the surface is similarly excited, and so on. As the muscular sensations give us the knowledge of the interior space that the sensorium occupies, so the tactual sensations give the knowledge of its bounding or limiting enclosure. We discover this limit by impinging it in every part upon surrounding objects, and thus exciting it to sentient activity. In the warm surroundings of a bath, or the bed, or a heated apartment, the surface of the body is defined by a gentle glow. If the temperature is cool, the same surface is made known to the soul by a rough and comfortless chill, that creeps over and pinches the sensitive wrapping.

Combination of
muscular and
tactual percep-
tions.

Second: The muscular and tactual perceptions being familiarly known and sharply distinguished, with the spatial relation of the interior of the body which they involve, the experimenter begins to combine the two in novel applications. One hand is placed on another, or on the arm, or on the face, or any part of the body. A new perception is the consequence; the muscular sensations beneath the surface touching and the surface touched are the same as before. Each touching surface, taken apart, is affected as before when brought in contact with a material object; but in each touching surface there is added the perception of touching and of being touched.

The sense-perception which is experienced on touching a table is clearly distinguished from that which is given when one's arm or hand is touched. This perception is more or less vivid and acute as greater or less pressure is applied. By noticing this distinction, the soul takes its first lesson in learning to distinguish its own body from that which is not its own body. It places its first uncertain step upon the frail and swaying bridge that spans the gulf which divides the material universe into two portions—the animated body, and that which is beyond. Its own body is known by the positive experience of muscular sensations which it gives, limited by tactual sensations at its periphery. Moreover, when it is touched by the hand, a special form of tactual sensation is experienced. The absence of these muscular sense-perceptions, when touched, distinguish a certain class of objects as diverse from all those which have them. This is the distinguishing mark of extra-corporeal objects. It is not, however, enough that objects are distinguished as extra-corporeal. They must be also known as diverse in space—i. e., they must be known as extended, and thereby involving a space which is beyond or without the body. This suggests the third acquisition.

Space-relations
of the extra-or-
ganic; how ac-
quired.

Objects corporeal and extra-corporeal can be grasped by the hand, and in this way can be known as occupying space.

When a blind man grasps his own arm or wrist, he knows certain muscular sensations as extended through and posited in the space within the opposite surfaces that he touches. If his wrist is withdrawn from the enclosing grasp, and an extra-corporeal object is inserted in its place, the adjustments of the grasping hand are the same as before, the dim knowledge of the space which these adjustments involve is also the same. All is the same, only there is no direct perception by the sensations located within the wrist. The stick is felt by tactual perception in

all its directions of surface. So far as any knowledge of surface by contact is concerned, it is in both cases the same. The wrist is known by direct perception as space-filling. The enclosing hand is a measure of the space enclosed. The same enclosing or grasping hand measures the surface of another body, but this body yields no muscular percepts involving extension. It occupies, however, precisely the space which the other filled. It is known, therefore, as space-filling, and as filling other space than that of the body. The mind has made the acquaintance of extra-corporeal objects as extended in space, and it has made it on the authority of touch alone.

In this way is it possible for the mind, by touch alone, to reach the extra-corporeal world, and to know that all its objects, like the body with which it is directly connected, occupy space. By the motion of its own limbs, known and judged by muscular sensations, it soon learns direction in space. By the comparison of its direct experience of the interior of the body as revealed by muscular perceptions, and of the exterior as revealed by the tactual, it learns the difference between the outside and inside of its own body, and of any material object. By the repeated application of any portion of the surface of the body as a measuring unit, it learns size. After it has learned what a single step signifies, by repeating the number of steps which must be taken to reach an object that is remote, it learns distance. By studying closely the other indications which touch reveals, it masters all the variety of knowledge of material things which the combinations of touch can reveal. The processes of the blind are slowly and painfully performed, but they are shut up to make the most of them by the necessities of their condition.

These processes are all acquired, and that which is acquired in them all is the single power to use one *percept* as the sign of another, or of some relation which is indicated by the percept as its invariable attendant—*e. g.*, outness, extension, direction, distance, size, and the like.

The theory of sense-perception, taught in this volume, coincides with the theories of John Müller and Sir William Hamilton, so far as they agree, *vis.*, that we have a direct or intuitive perception of the extended organism, and an indirect or acquired perception of extra-organic matter. Müller explains the last process, substantially as we have done, though with less detail. Hamilton explains it thus: "The existence of an extra-organic world is apprehended * * * in the consciousness that our locomotive energy is resisted, and not resisted by aught in our organism itself. For in the consciousness of being thus resisted is involved as a correlative, the consciousness of a resisting something." *Appendix to Works of Reid*, Note D^a, 28; cf. 20, 78, 21, 25, 26; cf. 884, Note D.

This explanation of the process supposes the application of the relation of causation. For it represents the locomotive energy as a causative energy which, unresisted, would produce certain effects, which effects are overborne or set aside by an agent which is known to be not the *ego* or the organism with which the *ego* is connected. From the presence of this new and strange effect, the existence of an extra-organic agent is inferred. The theory is in *principle* the same with that of Dr. Thomas Brown, which we have already noticed (§ 130), with this difference, that Brown supposes the cause and its activities to be both spiritual and non-extended, while Hamilton supposes the locomotive energy to be known directly as extended. The validity of the inference supposed to be derived, depends on the perception of a differing event in each of the two cases, and on the apprehension of each as an effect requiring a cause for its explanation. The first of these will not be denied. The second is not so obvious and certain. To this is essential that the locomotive energy as a causal energy should be regarded as capable of an effect, and this effect must be known as intra-organic. If the locomotive energy is connected with this effect as its cause, 't must be by the design to produce this effect, which designed effect is not reached. This would require a higher development of the reflective consciousness, than can be supposed at the early period when the infant apprehends the extra-organic, or the *non-ego*. It seems more rational to account for it as we have done, by the presence and absence of certain tactual and muscular sense-perceptions. When the reflective consciousness has been developed and the relation of causation is familiarly handled by the mind, this process would confirm and make definite our belief of extra-organic beings and agents.

A more serious difficulty is involved in Hamilton's theory—the same, indeed, which in another way is fatal to that of Brown (of § 131), viz., it seems not to explain how in the necessity of finding for this effect an extra-organic cause, this "correlative" "resisting something" must be shown to be also *extended*. The agent, the ego, as a percipient and actor is not extended, why may not the extra-organic agent and *non-eye* be non-extended, or why must it be extended? How is it shown to be correlative so far as to be extended, except it is taken to be the analogon of the extended organism, i. e., like it in being spatial in many percepts, etc., etc., but unlike it in certain other sense-percepts, as we have explained.

With the eye another problem begins. § 156. Let, now, the eye be opened, after all the acquisitions have been made which are possible to touch, and another

duty would be imposed, viz., the duty of connecting the perceptions of the eye with those appropriate to the hand. This duty is, in fact, performed by every person born blind, to whom sight is given in later years. In the developments of infancy, the eye performs a service similar to that which it renders in the acquisitions made by the blind in mature life; with this difference, that the eye does not wait to furnish its aid till the hand has done all that it can possibly accomplish without it. When the eye and the hand are developed together, by their mutual aid they greatly shorten the processes of acquisition, and of making the results more sure. What each can do apart, we have already considered. It is fair to infer that in the processes by which infancy makes its acquisitions, that what each can do best it will perform for the other. If the touch gives the first distinct knowledge of the third dimension of space, it places this knowledge at the service of the eye. The eye, if it cannot directly discern distance, can yet observe and interpret the signs of distance. The hand can determine the relative distances of objects only within its reach; or it must measure off distance by counting its steps, carrying the body as it goes. But the eye can, by a glance, reach for rods and furlongs and miles, and measure with sufficient accuracy for the common occasions of life. In respect to direction, how helpless is the hand without the eye. If we hold a ring with one hand, and, with closed eyes, seek to thrust a stick through it by a single effort, we can do it with little precision. Even the blind must be cautious and slow in the movement, and uncertain of the result. But the eye fixes its gaze on the object, and directs the practised muscles to strike the mark with the nicest precision. By the eye, the muscles can be adjusted to sling a stone, to hurl a lance, to aim the rifle even at moving objects, and to strike these objects with marvellous accuracy. All these feats would be impossible without the eye. They are accomplished with the aid of the eye only as the muscles are so adjusted, by means of the sensations which indicate their position, as to signify that through these adjustments the mark can be reached on which the eye is fixed.

That the eye and the hand must conspire in infancy, is not only fairly to be inferred, but it is evident from observation of the experiments which the infant is continually making with both.

Observations
on infants.

First: it is evident that the infant *learns* to touch; by which we mean not merely that it

learns to use its hands, but that it learns to use them with intelligence, and to interpret its touch-perceptions. Second: it is equally evident that it learns not only to use its eyes in seeing, and to judge what its sight-perceptions signify, but also to combine its sight and touch-perceptions together, and makes the one to serve as the signs of the other.

As the eye of the infant rolls or rests in the socket, or is caught for an instant by the excitement of the stimulating light, so the hands and arms, at first, hang uselessly from the shoulders, or dangle hither and thither, resting on whatever may sustain them. They can neither grasp nor hold, much less can they be carried to a point on which desire fixes the eye; nor can they, in obedience to desire, hold and carry an object, as food to the mouth, or release it when it is brought to its destined place. All these uses of the hand must be learned by attention. That they are learned, is evident from the aimless use of the hands at first, from the many experiments, and failures, and final successes which follow, and from the gratification that is manifested at success.

The earliest objects which attract the persistent attention of the infant's eye are the hands. As these are to be the instruments of its activity and the arbiters of its earthly destiny, it is natural and appropriate that they should occupy the largest share of its earliest notice. It is impossible that it should be otherwise for two or three reasons. They are always before its eyes, ever flitting to and fro in aimless and convulsive movements, and challenging its notice as they are passing across its limited field of vision. As if to concentrate the whole energy of the attention upon the action of the hands, the infant is short-sighted, and, till it is four months old, observes only the nearest objects, and then objects somewhat more remote, till, by gradual advances, the whole spectacle of the universe is unveiled and opened to the view. Cf. Loebisch, p. 28.

§ 157. But before we can connect the percepts of touch with those of sight, we must trace for a while the development of the eye. Vision seems to begin at that early period when the bright and steady light attracts and holds the infant's eye, or when, as it moves, it carries the eye with itself wherever it leads. Certain objects that glisten with reflected rays, or that are brilliant with intense color, are soon separated from the background of undistinguished things against which they are projected, or athwart which they are moved. It is not easy to decide how much of intellectual perception attends this early moving and fixing of the eyes, and how much is an unconscious and reflex response of the nervous organism to the stimulating light. The eye is so constructed that only a single portion of the retina can give a perfect image of an object that comes within the field of view; so that, when a bright object comes before the eye at all, it will hold or draw the eye to or after it, by the reflex action of the nerves which its brightness excites. Whenever the mind perceives such an object as a distinct and definite percept, then vision begins. Such a percept, as has already been explained, is known as a non-ego, and is known to be extended in two dimensions. We have already given the reasons why, in the beginnings of vision, the percept should not be placed in the retina or the eye (§ 135).

Why percepts of vision are projected in space.

It remains for us to show why, at the moment when this place comes to be fixed, it should be projected in space. With this projection of visible objects in front of the eye, begins its development, or education of the sense of vision, if this location is acquired, and not intuitive. It is not easy to explain the

steps of the process, or the grounds why its percepts are carried forward into space, and not located in the eye itself. Some contend that no explanation can be given, because none is required; that there is no problem, because there is no process, it being, in their view, by an ordinance of nature that the object seen should first be seen at the eye's focal distance forward, and that here is fixed the original starting-point from which all the acquired judgments of distance proceed. They insist that all objects, as viewed by the act of original vision, are seen in a hollow sphere—forward, above, below, on this side and that—whose radius is this focal distance. Cf. *Thorndale*, etc., by William Smith, pp. 441, 442. Such must of necessity hold that the act of projection is original, and not in any sense acquired.

Those who hold that it is acquired, give various explanations of the process. The most plausible is the following: The eye, though, like the hand, it is moved by muscles which are directed by the aid of the appropriate sensations, does not, when in its normal or healthy state, give any tactual sensations by the felt contact of its surface with the objects which affect it, nor do the muscular sensations themselves attract the attention. There are no positive experiences either of muscular or tactual sense-perceptions which should fix the visible object at the base or on the surface of the eye. These objects excite the idiopathic sensations of color, as the objects of taste excite theirs on the tongue, but without the sensations of contact and of muscular action, such as the tongue as a touching organ invariably gives.

We assume, before these experiments begin, that the eye possesses a native notion of space, which has become more or less distinct and familiar by the mind's experience of the trinal extension of the sensorium. We may assume, moreover, that in the way already explained (§ 155), space and spatial objects external to the body have become familiar through the sense of touch and the use of the hand; in other words, that space has been prolonged or projected beyond those limits which the experience of contact has drawn around the sensorium.

At the surface of the eye such tactual experiences are wanting, and of course no such limits can be defined. So soon as the lids are raised and the experiences of color are made, the eye gropes after these strange objects, but cannot touch them. It reaches after them, as it were, but they are beyond its reach. But still they exist. If they draw near, while the eye regards them, they fill more of its field of view; if they withdraw, they occupy a less extensive plane. Meanwhile, as they draw near or remove, the eye is adjusted to perfect vision, and its adjustments and motions are known by changing sensations; but still the objects cannot be touched, nor can they be reached. By all these criteria, visible percepts are strikingly contrasted with those which are tangible—they exist; they cannot be touched by the eye, nor can the eye reach them. They are in space somewhere without the body. This *somewhere* is definitely fixed as soon as the object seen, coincides with the object which is touched. The *where* of its percept, after which the eye inquires, is answered as soon as the hand touches the object seen. The limited distance which is measured by the sensations proper to the extended hand, becomes fixed and clear, and the object held by the hand and gazed at by the eye is distinctly projected in space. Henceforward the eye and the hand go together beyond the limited range which is at first allotted to them, into the unexplored infinitude that awaits their labors. "*Wir schieben die auf unseren Augen liegende Hohlkugel fast im eigentlichen Sinne des Wortes mit den Händen von uns fort.*" M. J. Schleiden, *Zur Theorie des Erkennens durch den Gesichtssinn*, p. 41.

Then comes the power to set up a field of vision. First, the mind must construct certain definite objects of vision out of the bewildering multitude of colors and outlines which present themselves to the unpractised eye. Next, it must select a few of these objects for its observation at a single look. These it must place in a plane more or less distant, leaving out of distinct vision objects near and remote, estimating distance and judging size in the ways already explained. These acts and judgments of the quick and sensitive eye, aided by the slower and cooler hand, must be repeated again and again, till any required field of vision can be selected and constructed with ease and precision, so that we seem to see space, distance, and dimen-

sion by the *simple* glance of the eye. These space relations, when once learned, are so few, so simple, so easily indicated, and so completely established, that they seem never to have been learned at all. They become entwined in all our associations; they leap at once to the imagination; they preoccupy it so completely as to shut out the possibility of the opposite their suggestions are accepted by the intellect with a rapidity that often leads to illusion and error. Hence is it that all the so-called subjective sensations are at once projected into space. Hence, when the veins of the retina themselves become the objects of vision, they are seen *afont* of the eye, a dark arborescence projected on an illuminated background. Hence, when we look into a mirror, either natural or artificial, we see all its reflected objects in the depths of space. Hence the spectra of the imagination, the visions which haunt the phantasy of the diseased and insane, are all distributed in space.

Returning to the sense of touch, we observe that :

The connection of the hands as seen and the hands as touched.

§ 158. The first acquisition of sight and touch is to connect the hands as seen with the hands as directly felt and managed through the muscular sensations. Before this is possible, the hands as seen must become familiar as definite and separated objects, with forms that are easily recognized. The muscular sensations must also have become definite and distinct to the attentive intellect.

Another touch-perception should not be overlooked:—that is, the tactual sensations must also have been familiarly observed, definitely distinguished, and so far connected with the muscular and internal, in the way already explained, as to enable the infant to know that its hands are *a part of its own body*, as well as to distinguish its body from other material objects. This knowledge being given, the mind must learn to connect the hands as seen, with the hands as moved and touched. To unite these two percepts is one of the first and most important of the acquired perceptions which the infant masters. How this can be effected, seems not difficult to explain. It should be considered, for the reasons already given, that these three classes of objects are the only objects with which the infant is conversant. These occupy its sole attention. They constitute and complete its universe. Two of these coincide in place. All these coincide in time. They all occur together. How can the seen hand be connected with the hand that is touched and moved? We answer—just as soon as the mind can raise this question, or just as fast as it can have the knowledge of the relations of place and distance with which it is concerned, just so soon is it qualified to know that the object seen is in the same place with the hand that is moved and handled.

Let one hand lie upon another, or let the hand rest upon a material object that does not belong to its body. The eye watches the process, and as the hand holds the surface with its sentient touch, so the eye holds it with its gaze; it observes that what was still, is now in motion; that what was seen, is now covered, and by the interposing hand. Or, if the process be described in terms taken from the language of vision only, one patch of color or shade or light is obscured by another which moves before it and hides it from the view. Or, one is moved behind another, and is hidden from sight. In this way the two percepts coincide in place, and one is made the sign of the other; when one is seen, it is expected that the other will

be felt; when one is felt, the mind expects that the other will be seen. As the mind proceeds and masters the other relations of form, place, size, distance, etc., the import of either percept as a sign of the other becomes to the same extent enlarged. It is a sign not only of the other as a percept simply, but of all the relations which it signifies.

The world of the eye and the world of the hand. It is manifest that the explanation of the process by which the infant learns to connect and unite the percepts of its hands, or of other parts of its body, applies equally well to those acts by which it learns to connect the percepts of all material objects, so as to view them as single things. That this power is acquired, and neither innate nor connate, is obvious. That it is acquired by experiment and observation, is equally clear. The world of the eye and the world of the hand are at first diverse and apart. How to bring them together, is the first problem of infancy. Upon this problem it tasks its earliest powers. At last these two worlds rush together, coinciding so completely that it seems inconceivable that they should ever have been held apart.

But why, we often ask, if these two worlds were once separate, and were only united by the slow processes of early experiment, why cannot we part them a second time? Why cannot we sometimes perceive by the eye alone, omitting all the inferences which we borrow from touch? The reason is, that what we learn so early, we cannot forget or leave unconsidered. The facts are so important, so constantly used, they have been learned so long and have been used so often, that we cannot imagine a condition of existence in which we did not as yet know them. We might as easily forget that we can count, or forget the alphabet, or forget our very selves, as to place ourselves in the condition in which we were before we united the hand which we see, with the hand which we touch and move.

Other acquisitions of infancy. § 159. But to proceed with our eager and impatient infant. As soon as it has mastered the objects within its reach and range, so that eye and hand are united as one, each helping the other, it makes the hand aid the eye in respect to objects which it cannot feel and handle. This it can do only by careful experiments, involving many errors. Indeed, the infant scarcely judges by the eye of any object which it cannot also handle and measure with its hands. Every thing else is either unregarded and vaguely stared at, or it haunts the vision as something it cannot interpret. It is not till childhood is reached and thought is developed, and the power of comparing and reasoning is consciously developed, that distant objects are cared for and judged of with intelligence and confidence.

It is instructive to watch the timid yet adventurous experiments which an infant makes, especially with its hands. First, it strikes about in aimless efforts, or makes a play for its eyes with the half convulsive motions of its little fists. By a gradual progress it learns to reach after the few objects which the eye has separated from the background—the infinite unknown which lies beyond its reach and beyond its aims. Soon it endeavors to lay hold of objects which the eye rests upon that are quite beyond its reach. It clutches after the distant lamp, the fire-blaze, or the polished fire-iron. By slow but sure progress it masters the objects within its own apartment, and can apply its rude standards of size and distance to the objects within

the apartment, to the finite world which its four walls enclose. All beyond is infinitude. During this time, as has been said, the infant is short-sighted, till many mouths of its life have elapsed, with the express design that it should be forced to master all near objects before it is tempted beyond.

How the world appears to an infant.

If we would conceive how the world out of doors may appear to an infant brought to the window, after it is somewhat familiar with the form, size, and relative positions of the objects within, we may read what is told of Caspar Hauser, who is said to have been confined, till the age of seventeen, in a darkened apartment, without communication with nature by the senses, or with man by language. The story, whether true or false, meets the case. "I directed him," says his teacher, "to look out of the window, pointing to the wide and extensive prospect of a beautiful landscape that presented itself in all the glory of summer, and asked him whether what he saw was not very beautiful. He obeyed, but instantly drew back with visible horror, exclaiming, 'ugly, ugly!' and then pointing to the white wall of his chamber, he said, 'there not ugly.' Several years after, his friend asked him if he recalled the remembrance of the scene, and of his own feelings, and he said: 'What I then saw was very ugly; for when I looked at the window, it always appeared to me as if a window-shutter had been placed before my eyes, upon which a wall-painter had spattered the contents of his different brushes, filled with white, blue, green, yellow, and red paint, all mingled together. Single things, as I now see things, I could not at that time recognise and distinguish from each other. That what I then saw were fields, hills, and houses; that many things which at that time appeared much larger were in reality much smaller, while many other things which appeared smaller were in reality larger than other things, is a fact of which I was afterward convinced in the experience gained in my walks.' He also said, 'that in the beginning, he could not distinguish between what was really round and what was only painted as round or triangular. The men and horses represented on sheets of pictures appeared to be precisely as men and horses carved on wood.'"—Caspar Hauser; *An Account, etc.* (translated from the German), pp. 88, 89. 2d edition. Boston, 1833.

We need not pursue our synthesis further. We need not further ask how the infant builds up the rest of its knowledge, or acquires its infant skill. We need not ask how the infant learns to use its hands, to grasp, to hold, and to handle a spoon, a fork, or a knife, or how it learns to walk, or talk; for all these processes can be explained by analogous processes which occur within our recollection. Still less need we ask how it learns to connect the percepts of smell, of taste, and of sound, with their appropriate objects. These problems present no difficulty and require no solution.

We persistently ask why we cannot unravel some of these combinations which we make in earliest infancy, and more than half discredit the assertion that we make them at all. We forget that, in respect to analogous processes in later life, we cannot place ourselves at a point behind them; we cannot remember where we were, nor what we knew, before we had mastered the skill to use them. It is the result which interests us, and which occupies the attention so as to impress the memory. The process does not impress us, because we do not watch it; therefore we forget it, or, rather, never recall it at all. The state in which we were, before the secret of interpreting one percept by another, is also left behind. Now that we can interpret the indications aright, it seems to us that we always could. Hence we cannot imagine the condition in which we did not know and could not understand that which we cannot cease to know and interpret.

As to the question whether the mind, in earliest infancy, is competent to intelligent perception at all, that has been fully discussed in answering a similar inquiry in regard to a somewhat later period (§ 148).

The blind from birth, upon the recovery of sight.

§ 160. The phenomena attendant upon the recovery of sight by persons who had been blind from birth, have already been referred to as illustrating and establishing some of the positions advanced in the preceding chapter. They deserve a separate and more particular notice.

Such persons are like infants in this respect, that they must learn to see—i. e., they must go through all the processes of which the infant has experience. In doing this, they must use and so bring to light the several stages or steps of which the processes are composed, as well as the grounds or data of judgment on which the several acquisitions are founded. They differ from infants in this respect, that their perceptions of touch are already perfected when they begin to see; while those of the infant are developed in connection with, and often by the aid of the acquisitions of sight. The blind person has also a greater maturity of intellect, and of course a higher capacity for performing the judgments and forming the habits which are involved. They have the disadvantage, on the other hand, of being more occupied with other objects, so that their attention is likely to be less concentrated upon this problem. Their sensibilities are less quick and plastic than are those of infancy. The value of the recorded observations depends greatly upon the intelligence and the honesty of the observer. The patients cannot be supposed capable of analyzing their own processes. Those who observe them, ought to be acquainted with the problems or questions to be solved, so as wisely to conduct their own inquiries and skillfully to apply the decisive tests, or *experimenta crucis*. In the words of Diderot: "To prepare and question one born blind, would not have been unworthy of the combined talents of Newton, Descartes, Leibnitz, and Locke." They need also to be wary in their estimate of evidence, so as not to put leading questions, or to over or wrongly estimate the answers of the patient.

The cases which are most easily accessible to the English reader—which are, indeed, the most satisfactory and decisive of any on record—are those reported in the *Philosophical Transactions of the Royal Society of London* for the years respectively, 1728, 1801, 1807, 1826, and 1841. The persons operated upon differed greatly in respect to age, mental capacity, and the degree of their previous blindness. The observations and experiments with all of them may be accepted as having established the following facts and truths:

The patients, as soon as they began to see, saw objects not only as colored, but as extended. Their experiences give no countenance whatever to the views of Stewart and Brown, that color can be perceived without extension, and that the two are united by inseparable association. It is true that in almost every case the patients, previously to their recovery to sight, had some experience of light, and of course of light superficially extended or diffused. But this experience of light was so obviously dependent upon the affection of the retina, as to indicate, if not to prove, that any experience of light whatever involves the perception of extension.

The extension which they perceived by sight was in two dimensions only. This was made evident from a few experiments instituted with express reference to this point in the case of one of the most intelligent. A solid cube and a solid sphere were both taken by him to be simply discs or planes. A solid cube and a flat projection of the same were both taken to be flat and in every respect alike. A pyramid, when turned toward him so as to present one of its sides only, was called a triangle. When the pyramid was turned so as to expose a part of another side, he could not make out what it was.

As to distance from the eye or the place where objects are located in original perception, the testimony is unanimous and decisive that objects at first seem very near—how near, could not be exactly known—and that the relative distance of each object beyond this indeterminate limit is learned by experience. Most of the patients were afraid to move, lest they should hit against objects that were comparatively remote. Two or three of the patients, in attempting to reach objects extended to them, clutched behind the objects when held near before them, and when more remote, only succeeded in grasping them after repeated efforts. Cheselden's boy said, at first, that all objects touched his eye. The boy reported by Sir Edward Home (1807) said the sun and the candle touched his eye, even before the cataracts were removed; and, just after the first operation, said the head of the surgeon did the same. But after a second operation, he said the sun and candle did not touch his eye. It is probable that the objects which were said to touch the eyes, in these two cases, stimulated the eye so actively as to present some analogy to the muscular sensations accompanying touch, with which, in every

possible form, the patient was so familiar. Hence they interpreted and called these experiences perceptions of touch.

All these persons were forced to learn by experience to combine the percepts of sight with the familiar impressions of touch, so as to translate the one into the other. All experienced a difficulty similar to that of Cheselden's boy with the dog and cat. When they saw objects a second time, and were not certain that they could recall them, they reached for them with the hand, and could not be content till they had handled them a second time. Their judgments of size and form all needed to be acquired. Visible mathematical figures, as a square, a circle, and rectangle, could not be recognized till the fingers were resorted to. One patient did make out one or two of these figures, by drawing the outline with her finger in the air, and, as it were, constructing the figure with the finger, after the lines presented to the eye. Another could not understand how drawings of objects could represent the objects, till he revived the percepts of the objects in his fingers. Most of them were embarrassed by drawings and pictures, not being able to see likenesses or to understand perspective, or to perceive that light and shade represented form and distance. Their judgments of the comparative size of objects were embarrassing to them. Cheselden's boy knew that his own room was a part of the house, but could not easily believe the house was so much larger than the apartment.

The testimony is uniform, also, that, in learning to see objects as separate things, the constructive power is brought into play, requiring intelligent attention and constant memory on the part of the percipient, and that it is only slowly, at best, that the mind learns to set apart its separated objects, to form its field of vision, to locate objects as near and remote by the various signs which it learns to interpret. In short, these observations and experiments confirm and illustrate all that has been said in this chapter in respect to the early development and growth of sense-perception.

CHAPTER VII.

THE PRODUCTS OF SENSE-PERCEPTION; OR, THE PERCEPTION OF MATERIAL THINGS.

Thus far we have considered sense-perception as a process, and in its growth. We proceed next to discuss its results in those products which become the permanent possessions of the mind. We have already explained of knowledge in general, that, as an activity of the intellect, it is brought to its appropriate termination when its objects can, so to speak, be detached from the process by which they were so matured as afterward to be retained, recalled, and recognized. This is eminently true of this form of knowledge. Sense-perception is only complete when it results in the knowledge of material things.

Material things
and sense-per-
cepts.

§ 161. A material thing or object as known by sense-perception is a completed whole made up of separate percepts.

We distinguish the knowledge of things from the knowledge of percepts. A *percept*, as has been explained, is the appropriate object of the mind's knowledge through a single organ of sense. A *thing* is the result of the mind's knowledge in apprehending several percepts as united into a finished whole, with the relations which this combination involves.

As an example of the difference, take an apple. The apple seen, touched, smelled, tasted, and heard, are separate percepts. The object perceived by the combination of all

these percepts is the apple, or material thing. The separate original perceptions give as many percepts. The original and acquired perceptions, when united as a whole, give material objects or things.

Two questions now present themselves for consideration: By what means, and under what relations, does the mind unite separate percepts into things or objects? Under what conditions does the mind so complete its knowledge of percepts and of things, as to be able to retain and recall them as permanent objects of knowledge?

We begin with the first of these questions: By what steps, and under what relations, does the mind unite percepts into things or material objects? We answer:

§ 162. Percepts are united into things by two successive steps or stages, to each of which there is an appropriate product. By the first, it unites these percepts into a material thing, or whole, under the relations of space and time. By the second, it connects the whole and its parts under the relation of substance and attributive quality. These several percepts united in all these relations constitute what is commonly known as a material thing.

It has already been shown how the percepts of sight and the percepts of touch are referred by the mind to the same portion of space. The seen hand and the touched hand are found to lie in the same direction, and to be at the same distance from any and every part of the body, from which they are measured off by the eye. In the same way the apple or the egg, the chair or the table, which are seen and touched, coincide in the same portion of space. They are in the same place. By the same process the body itself has been previously perceived to be one material thing.

This coincidence in place is the first of the constructive or synthetic acts by which the mind, in sense-perception, forms to itself its perceptions of objects. The percepts of sight and touch are the most prominent and important. When these are united in one, the other percepts, as of smell, taste, and sound, are readily attached. The object which we touch, we also taste. We touch it when we taste it. The same object we touch and smell. The sound which we hear when it is struck, or when it falls, is referred to it more indirectly by a process and under a relation which we need not here explain (cf. § 166).

It is of course necessary that the percepts, thus definitely united in a common whole, should be distinguished from the other percepts which are apprehended by the same sense. Distinct and definite bounds of extension must be assigned to every percept, else they could not coincide with one another under the same dimensions. When they are thus united, the mind has perceived a material thing or object. The object perceived by the eye and the hand fills or occupies, as we say, the same space, and so far it is one object or thing.

Other relations are afterward apprehended, under which these separate percepts stand to one another, to the mind which perceives them, and to the physical organization by which they are perceived. But the relation of a common extension is the first in the order of time, and fundamental in the order of thought. The infant finds things when it fixes on a place for its percepts of sight and touch. It knows material objects when it discovers that what it sees and what it touches can be reached by its outstretched arm, or by a certain number of steps.

The first stage
of perception;
when complete.

§ 163. The first stage of perception is complete when it gives a material object, or whole, in this lower sense, viz., a combination of the percepts that are appropriate to each of the organs of sense, by means of the relations of space and time. The percepts of sight and touch are inseparably united in space, and this is the earliest combination made by the intellect which may properly be called a material thing. With these two are connected the percepts of taste, smell, and sound, at first under the relation of simultaneous occurrence in time.

It is obvious that the several percepts, when viewed as connected into a whole under these relations, have a very unequal relative importance. The percepts of sight and touch, to those who can see and feel, as they are defined in place and eminently objective, constitute the material object as it is usually conceived and named. The percepts of smell, sound, and taste, are its invariable attendants in time, until they are connected with it by another relation.

To those who see, even though they can also feel, the leading percepts are those of sight. The name of an object suggests its visible form and color, etc., rather than the object as touched; a certain and decisive evidence that it is the object as seen which is most prominent and attractive to the mind, and therefore is most readily recalled to the imagination.

To the blind, on the other hand, it is the object as touched, or the tangible percept, which is suggested by the name, and to his imagination constitutes the thing perceived.

The other percepts, as of taste, smell, and sound, are connected with the combined percepts of touch and hearing less readily, and by a looser bond. As at first experienced, they are referred to the sentient organism, and less readily separated from it. They are more sensational and subjective, less perceptual and objective. As to the manner and the relations by which they are first connected with the percepts of sight and touch, philosophers are not agreed. It must at least be true, that whatever other relations unite them to material things, they must at the very earliest period be their constant attendants in place and time.

However quickly the human intellect may learn to connect them with their objects under higher and more intimate relations, it must first know them as constant attendants one of another. When a given sound or smell or taste is perceived, it certainly connects it with the seen or touched object with which it has been previously attended. Under these laws or relations the human intellect recalls one percept by another percept, or one object by one of its percepts, even when it recalls them by higher relations. The animal intellect connects and recalls objects and percepts by no other.

When, then, the human intellect has learned to connect its percepts in space and time, as things or wholes, in the way explained, one stage or step in the process of perceiving material things or products is complete, and one product is evolved, viz., several percepts coinciding in space and time.

Material things
capable of various
significations.

§ 164. The conception of a material thing or whole, made up of extended parts or single percepts, is, however, very equivocal in its import and varied in its application. To an infant with limited experience, the greater part of an apartment may be perceived as a single object or thing; the only separable objects in it being the chair, table, and a few utensils, the position of which is often changed. To a child, a horse and carriage, seen together for the first time, may be a whole, or a single object. The savage perceives a ship or steamer to be a huge animal. Many observations and experiments, much

information from others, repeated lessons inferred from words and names properly applied, are required to enable the child to distinguish things as wholes and parts; to hold apart objects that should not be united; and to unite objects that should not be divided. The point of view from which objects are observed, and the purpose or use to which they are to be applied, direct in the formation and application of names, and determine whether this or that object shall be regarded as a whole or part of a thing. A house with its grounds, the house alone, an apartment, a door, a window, the smallest perceived portion of either, each and all, are things or parts of things, according to the principle or use which regulates the application of the respective terms. But whether a perceived whole is greater or smaller in its spatial dimensions, it must have defined spatial dimensions and be capable of being perceived by one of the leading senses, if it is perceived as a material thing. Whatever the thing may be, the percepts of which it consists must at least be capable of being perceived as occupying the same space, and of occurring together in time.

Percepts recalled
under relations
of time.

This, it should be observed, is a material or sense-object as perceived or as made ready for recall. When it is recalled, these parts, thus coincident in space and time, can only be represented by successive acts in continuous time. When a perceived object becomes an idea, the several percepts which

compose it are represented one by one—the form, the color, the feeling, the taste, the smell, and the sound. Even single percepts, when very extended or complicated, can be represented in parts only, in the successive instants of time which successive acts of representation require.

The second
stage: The re-
lation of sub-
stance and attri-
bute.

§ 165. By the second stage or step of the perceptive process, the several percepts or parts are connected with one another, or with the whole which they constitute, as substance and attribute. Thus the objects of the sense of touch are known as hard or soft, rough or smooth, elastic or non-elastic, etc., etc. Those of sight are red, yellow, orange, violet, and green; those of hearing are sharp, smooth, harsh, and sweet; those of smell are pungent, exhilarant, fetid; and all these qualities are ascribed to an object to which they belong, and of which they are affirmed to be attributes. Certain relations of time and extension, as long and short, square and round, are in like manner treated as properties or attributes. They are more than parts of wholes which they help to constitute; they are connected with a being or agent, the nature of which they define, the presence of which they signify, and the powers of which they manifest.

General defini-
tion of this rela-
tion.

It is not here in place to discuss the nature of this special relation which has occasioned so much speculation and dispute among metaphysicians (P. IV. c. vii).

It is sufficient here to say, that as we have already shown that knowledge of every kind necessarily gives beings and relations, or beings as related, we are prepared to understand the definition of a *substance as a being that is capable of being distinguished by relations*; and of *attributes, qualities, and properties, as relations used to dis-*

tistinguish and describe or define beings. That the objects of perception, both wholes and parts—i. e., combined and single percepts—are in fact connected in this way, is too obvious to require illustration and proof.

§ 166. The relations most frequently employed to distinguish and define beings, are relations of time, space, and causality.

As soon as beings are known as enduring for a longer or shorter period, or having this or that size or form, and these relations are used to designate or distinguish them from other beings, these relations become their attributes. As soon as the sense-object is known as the producer of sensations, as of smell, taste, or sound—i. e., as capable, under certain conditions, of producing these effects, it would be known as endowed with attributes; viz., distinguishable capacities to produce these effects. The sensations would, in their turn, be referred to these beings as their causes or originators. No illustration is needed to prove that the sense-element, the sensation, in these three percepts is naturally and early regarded as an effect. So far as the mind is passive in sensation, it must be so regarded. The sensation is experienced when the object or being is near. It is felt less intensely when the object is remote. Its quality or intensity, one or both, vary with the varying conditions of the object. When an object is struck by a certain material, as wood or iron, or with a given force, it emits a sound of peculiar quality and intensity. An object of a certain visible form or color emits a certain odor. Another object emits a different odor, and both these odors vary in intensity at varying distances. An object with a certain form, feel, or color, when brought in contact with the tongue or palate, causes a certain taste. This experiment is perhaps, of all others, the best fitted to evolve to the mind an apprehension of the relation of causality, leading to that of substance and attribute. Touched by the hand, no special novel sensation follows; but touched by the tongue and palate, there ensues the specific sensation of taste. The object touched might have been regarded as a simple being or thing; but the object tasted is known as also capable of originating the sensation in question.

Sensations of smell, taste, and sound, first used as attributes.

The three sense-percepts of smell, taste, and sound, as *percepts*, carry with them some vague relations to extension, as has already been explained. But these relations are likely soon to be overlooked, in comparison with the greater potency of the sensational element. This becomes still more prominent, because of its immediate relation to the forces which awaken the desires, and impel to action. The objects which we see and handle are very early regarded as interesting, from their power to impart pleasure or pain. They are sought or avoided with intense excitement of desire, and at the cost of toil and sacrifice. They are constantly contemplated as related to our appetites and wants, to our comfort and pleasure. Almost as soon as they are known as things, they are known as causers or producers of certain agreeable or disagreeable sensations, and are described and indicated by these capacities. These capacities are their attributes. By these they are known and recognized by the person himself. By these they are indicated and described to others.

Coexistence in space and time previous to substance and attribute.

It is quite conceivable, as has been already suggested, that before these percepts and sensations are connected under the relation of substance and attribute, they should be known as constant attendants, coexistent or successive, and that, simply as conjoined, the presence or the thought of the one should, under the laws of association, suggest the thought of the other. It is under this relation that things and properties are known to the animal. It is obvious that the animal cannot and does not distinguish the relation of conjunction from that of causation. If he has experienced one sensation or sense-percept in connection with another, the repetition of the one brings up the image of the other, and the pain and pleasure, the hope and fear which are appropriate to it. The dog connects with the whip in the hand of his master the thought of chastisement and pain; with the sight of his gun or his walking-stick, the excitement of a ramble or of sport. It is not easy to assert when and why the two relations are distinguished by man; that they are distinguished, is obvious, for reasons which this is not the place to give.

This relation supposes reflex and indirect knowledge.

We have said that it is not till the second or advanced stage of the perceptive process that the percepts are connected under the relation of substance and attribute. This is evident when we reflect that, as a kind of knowledge, this is indirect and reflex, as distinguished from that which is direct and objective. It supposes the objects related, the subject of sensations, and the object which occasions them, to be more or less familiar—to be discriminated respectively by consciousness and perception; and that both subject and object are projected in the view of the mind upon the same plane, so that both are objects to its thought. A thing cannot be known as capable of producing sensations as effects, unless the body or the soul, one or both, are known as the conditions or subjects of its action; and this requires that they should be placed afrent the reflecting mind by a special effort, requiring that maturity and discipline which time alone can develop. Moreover, it supposes some degree of generalization, and some sort of induction. Many objects must have been touched and seen, before they are so far recognized as similar as to be taken for the same, in their causal efficiency. Many experiences must be had with the sensations of smell, taste, and sound, before these could be invariably referred to the same substances, as dependent on their properties or attributes.

But generalization and induction are acts of thought, which is a power higher than that of simple perception. This is true; but it has already been remarked, and needs ever to be kept in mind, that the higher and lower powers, though distinguishable in the kind of their activity, are not separated in fact. Moreover, the action of the lower is not complete without the higher. In one sense it is true, that an act of sense-perception is not complete, and its product is not perfected, until the soul's higher energies are awakened, and the object of them has been viewed in the higher relations. The human being can scarcely be said truly to have perceived even a pebble, as a man, till he has brought into action all the powers with which he is endowed as a man. The higher energies also react upon the lower, and excite 'hem to greater efficiency. The relations appropriate to the higher, bring out in more striking relief those relations which are present even in the lowest acts. We may believe that even in the earlier exercises of the power of perception, there may be present some rudimentary activity of the higher capacities to modify, direct, and elevate them. The higher may shape the lower nature, through those intrinsic relations which always stand ready to be revealed, or those cravings and impulses which anticipate developed knowledge. The infant's eye may not

glisten with the penetrating sharpness of the eye of the young eagle, but it may wear the softer lustre which betokens dawning intelligence. The soul leaps into no single form of activity, least of all into the full development of its higher powers.

The relation of substance and attribute has by some writers been denied to sense-perception, and limited to thought or intelligence. Kant, by his nomenclature, would limit to sense-perception the relations of time and space, and derive from the understanding, or the logical faculty, the relation of substance and attribute. It is noticeable that Hamilton does neither. While by definition he limits relations of every kind to the elaborative faculty, viz., the intelligence, in his explanation of perception, he includes in this the knowledge of, and by, relations. His doctrine of immediate perception should give percepts only as extended sense-objects, but he makes it apprehend *qualities*, and not only qualities, but qualities of three classes, involving all the metaphysical relations of matter to matter, and of matter to mind. Moreover, he denies that by perception we have any knowledge of substance at all, this being a fignment necessary to thought, from the impotence and not the power of the understanding. The immediate perception of Hamilton, on which he insists so earnestly, in his own exposition, gives only the knowledge of an extended percept—which, in his metaphysical theory, is relative to some unknown and unknowable substance beyond—and yet as he contends, we have immediate perception not only of things but of qualities, and not only of qualities but of qualities in three classes.

Were the knowledge of substance and attribute the product of generalization, we should deny it to sense-perception, which by our definition has to do with individual objects only and the relations which they involve. The relation is not originated by generalization, however much it may be furthered and widened by it. It is therefore appropriately considered here.

Of touch and sight percepts conjoined: which is substance, and which attribute?

§ 167. Thus far we have called and known the substance as the object which is seen and touched, and its attributes as capacities to occasion the sensations of smell, taste, and sound. We have connected a *percept* with a *percept* as substance and attribute—a leading percept, as of sight, with a sensational percept as of smell—and called the one a thing, and the other its quality. Let us push our inquiries a step backward, and, laying aside all consideration of these three senses, inquire, Which is the substance and which the attribute when the object consists solely of a percept of touch and a percept of sight conjoined? We answer, The one which is viewed as a percept—i. e., as a spatial object—is made the substance, provided it is viewed in the relation of cause to the sense-element involved in the other. The object as touched and the object as seen, may respectively be substances, in their respective relations to the sensations of sight and of touch. We say, *it* is white—i. e., the object which I touch; and again, *it* is hard—i. e., the object I see—the touch-percept and sight-percept being each in their turn taken as beings.

When either are taken alone.

§ 168. Let us narrow our thought still more, and consider singly the object touched or the object seen. What is the being or substance, and what the attribute or quality, when we have a single percept only, and view it in relation to the sentient mind? We reply, The object, as experienced to be, is known as a substance when considered as the producer of the sensation which is the condition of the perception. The tangible or visible object, as a being, is distinguishable as a space-occupying or extended something. As causing or producing the sensation of sight or touch, it is known as possessing the attribute of color or touch. The elements involved in every act of sense-perception provide for the possibility of this relation. The relation is not, in fact, discerned until the mind projects and brings up the perceived non-*ego* and the sentient *ego* into the same field of vision, by a reflex and comparing act.

The sensation—i. e., the effect—is not the property or quality which produces it, though the two are called by the same name. Sweetness means one thing when it is said to be in the sugar, and another when it is experienced by the sentient soul. The heat, in one sense, is and in another is not, in the fire.

Attributive quality of form and size.

§ 169. A single additional remark is required concerning the attributes or properties of dimension and form, in material objects. We call an object long and short, round and square,

and, in so doing, distinguish the being from its attributes. Here we ask again, What is known as the being or substance? We are forced to answer, that the being or substance, in the concrete thinking of ordinary men, is regarded as that which is touched or seen; and this is the substance which is long or short, round or square. The being of the abstract thinker is, as we shall see, a generalized conception, which is equivalent to this or that perceivable or knowable thing of which the metaphysician says, *it* is long or short, round or square.

But with the metaphysical conception of substance and qualities we need at present have little to do. The questions concerning substance and attributes in the general—concerning material substance in particular, and concerning the various divisions of sensible qualities into essential and accidental, into primary, secondary, and secundo-primary—may all be reserved for a more advanced stage of our inquiries, and another part of our treatise (P. IV. c. vii).

Conditions of permanent perception. § 170. Our second question is, *Under what conditions* does the mind attain a definite, permanent knowledge of the objects of sense-perception, whether *percepts* or *things*, so that they can readily be recalled and recognized? It is only when they are placed so completely in the possession of the mind as to be at its disposal, that the process of perception can be said to be complete. A far larger portion of the objects which we, in some sense, are said to perceive, fail entirely to be perceived to any effectual result. It is only a few of the myriads which we know, that we know in such a way as to be able to retain and recall them.

Ideation of sense-objects. When this is done, the object of perception is converted into an idea or image. The real object apprehended by the mind becomes an intellectual object, having a purely ideal or psychical existence. By some writers the special term *ideation* is appropriated to this process. Sense-perception is said to be complete in the *highest sense* when its object is ideated, or becomes an idea. The relation of the *idea* or *image* to its real correlate will be explained in its place. At present we need only notice that the appropriate result of the process of sense-perception is that it gives the power to recall and recognize the object perceived.

Reid says, Essay II. chap. v., that the act of perception involves three things, of which the first is, "some conception or notion of the object perceived." It is evident from the illustrations which he gives of his meaning, that he confounds the act of originally gaining knowledge of an object by perceiving, and the act of recalling and recognising the object afterwards. He should have said, that the act of perception involves the *gaining* or *forming* "some conception or notion of the object perceived," i. e., the performing a process—which results in the acquisition of a percept or idea.

When is perception complete? § 171. But as every perceived object is composed of parts, as has just been shown; it follows that the perception of a thing can only be complete when the mind attains ideas of the parts or percepts of which the thing is composed, and of the parts as related to one another. In other words, the mind must distinguish the constituent *percepts* by completed or perfect acts of original perception, and combine or connect these percepts into *things*, by finished acts of ac

quired perception. It is obvious that it is impossible to have an idea of the whole, without an idea of the parts. It is equally obvious that, whatever aids in the attainment of a distinct and permanent idea of a part, favors, rather than hinders the gaining of an idea of the whole. We are naturally led to consider the conditions of complete perceptions of the parts and relations of material things.

Perceptions of objects, in order to be complete and permanent, must be distinct and definite. That is, the objects themselves must be distinguished from other objects.

This rule holds equally of percepts and of things. A single color, sound, touch, taste, etc., in order to be mastered, must be distinguished from every other color, sound, touch, and taste. So of things: a chair or a table, a house or horse, a pin or needle, even a grain of sand or a particle of dust, to be perceived in the sense described, must be distinguished from every other. It is, of course, implied that the power of distinguishing is gradually developed. To the infant, many colors and sounds, tastes and touches, are indistinct, which to the senses of the adult are clearly distinguished. Even many individual things are perceived as the same, which, to a more practised observer, are known to be diverse. We name, as the first condition.

First condition of completed perception: Energy, contrast, and resemblance.

§ 172. (1.) Objects are most easily distinguished which are apprehended with great energy—which are very strikingly contrasted with, or which are similar to other objects. A lively color, a loud sound, a positive taste, etc., are more readily apprehended than a color which is faint, a sound which is feeble, or a taste which is not positive. Things are more or less readily perceived with effect and permanence according as the percepts of which they are constituted are more or less readily known.

The definiteness with which objects are perceived depends in part also on their likeness or unlikeness to other objects in connection with which they are presented to the mind. Of two percepts and two things that are very similar, and of two that are very unlike, those are more likely to be perceived which are in striking contrast to each other, than those which closely resemble one another. Two colors, two sounds, etc., as well as two apples or two paintings, are each more readily perceived and retained if they are strikingly contrasted, than if they are very similar.

Resemblances and contrasts, objective and subjective.

The likeness or unlikeness, the resemblance and contrast, are in part purely objective,—pertaining solely to the object perceived as related to the powers of sense-perception supposed to belong to all men. In part they are subjective, and arise from the natural or acquired capability of the individual to feel and know. Thus, one class of persons are physically incapable of distinguishing different colors—as those who are color-blind. Others, who can discern the colors which are commonly named, can with difficulty distinguish shades of color that are nearly allied. Some persons are very insensible to differences and similarities of sounds, to which others are keenly alive. Even when the original sensibility of the senses and aptitudes of the intellect present no diversity, there are the greatest possible differences of susceptibility, arising from differences of habit and attention.

Force of contrast.

But under all these diversities of natural and acquired susceptibility, the law enounced holds good, that objects which to any one individual percipient are nearly alike, are less likely to be distinctly perceived and retained: while those which are set off against others by a positive and striking contrast, are far more likely to be perceived with that energy which is essential to distinct and definite recall. This law is established and confirmed both by observation and experience. The infant fixes its attention on those percepts and those things which are positive in their action upon the senses, and which are strikingly contrasted with others. A bright light in surrounding darkness, as a sunbeam through the shutter, the flame of a lamp with its distinct outline, a patch of bright color, a shining fire-iron—these first hold the eye with that fixed and considerate attention which is necessary to retention and recognition. In mature life the same law holds good: objects that are bright and distinct, or that in any way are presented in contrast, are those which are most readily noticed and most easily remembered. If the object has no interest for our fellow-men, but has a special interest for us from any cause whatever; we need only perceive it, to be able to retain and remember it. The eye and the hand, the ear and the tongue, seek first of all to define the objects which they are to retain, so as to fix and hold the attention, and carry away a distinct idea.

Second condition is motion.

§ 173. (2.) Motion heightens the contrasts of perceived objects, and gives definiteness to the outline and limits, especially of visible percepts. To the infant's eye, moving objects are the first which, so to speak, are separated from the undistinguished mass of blended color, in which the world of matter is at first arrayed. From this extended surface of color certain objects are detached, as the moving lamp, the walking person, the portable furniture and utensils. They pass to and fro athwart the background upon which they are projected, and are brought into contrast with its unbroken surface, till they take their place in the memory, as the first distinct objects with which it is provided. By degrees this undistinguished mass of blended light and shade, of form and color, is broken up, as one and another separate percept and distinguished thing is detached by the mind's observation and is set apart in the mind's storehouse as a distinct idea. The influence of motion is not limited to visible objects. It is most important in giving distinct percepts to the sense of touch. The hand must move over the surface felt, or the surface must move over the hand, to leave distinct percepts of its limits and qualities.

Third condition, repetition.

§ 174. (3.) Repetition is an efficient and often an indispensable condition to the completion of an act of perception. Even the simple percept, as a sound, a color, a taste, is more perfectly mastered by being apprehended in successive acts of attention. If several percepts are to be united as a single and separate thing, it is still more requisite that they be often apprehended by the same or continually connected acts, in order that the object may be brought completely into possession and placed entirely at command. This is especially necessary if the percept or object, by reason of its spatial extent or the complexity of its elements, is beyond the power of the mind to master in a single act. In some cases, repetition serves to make the impression more

vivid and definite. In others, it is required in order that there be any impression at all.

We have already observed, that no object of the mind's perception can be retained unless it is perceived with aroused and concentrated energy. The repetition of any act, if not excessive, contributes to such energy, and hence contributes to the definiteness and permanence of the object. This is the general law. Its application to individual objects varies somewhat as the object is simple or complex, as it can be mastered by a single effort, or as it requires a succession of acts.

Different schools of psychologists give different explanations of the utility and necessity of repeated impressions, according to the fundamental principles by which their school is characterized. The school which resolves sense-perception into the passive reception of impressions from without, explain the necessity of repetition by its influence in accumulating a stock of such impressions—either in the subjective capacity or the objective material.

Herbert and Beneke agree in this view of the nature of repetition so far as to hold, that each act of sense-perception leaves an impression or an effect behind—either in the soul itself, or a force acting within the soul. Before distinct perception is attained or consciousness is developed, there must be many repeated sensations in order to give a single positive or distinct perception. These are all accumulated, each reinforcing the other—till at last, by the addition of them all, the mind attains a distinct and definite percept, as of a single color, sound, etc. After these percepts are reached, made up as they are of the residua of many single acts of sense, it is necessary that these again be perceived in combination by many repeated acts, before the mind reaches a permanent and definite perception of a thing.

The effect on the soul is called by Beneke *Spur* = *trace* or *relict*; *Angewohnheit* = *predisposition*. The effect of Herbert is in the form of a force or tendency imparted to the object or idea—and is called a *residuum*.

In other words, according to these psychologists, repetition is necessary because each act leaves some effect behind, which is added to the stock already accumulated, the final result of the accumulations in all cases being distinctness and permanence in the object perceived, whether it be a simple percept, or a complex of percepts in a material thing. Their error lies in the mistaken or defective view of the mind's activity and its dependence on the conditions of its success, which they adopt. The mind, in knowing generally, and in perceiving in particular, is not as they conceive it, the passive subject of impressions—of which there must be a certain number with a given strength, to secure a definite and abiding result. The mind, in all its knowing—and consequently in all its perceiving—exercises a peculiar act, which we have defined as the being certain that some object is. This act is entirely different from the passive reception of any accumulation of impressions, each swelling the number and augmenting the strength of those which have gone before. So far as the act of knowing is concerned, a single exercise of this activity is adequate to a distinct and lasting impression. In not a few cases a single effort or application of the mind is as efficient as a score, in order to effect a lasting remembrance. Let the attention be fixed and held, and the whole force of the mental power be applied, and the mind cannot but receive a vivid and definite knowledge of a distinctly remembered object. A single stroke upon the dial will leave a sharp and clear impression as truly as many and oft-repeated blows. And yet in point of fact, it is observed, that to the apprehension of most objects, many applications of the mind are required; the single act is not adequate for a permanent impression; a single acquisition does not suffice. How is this possible? What is there in repetition which arouses the attention so as to fix and make lasting the object? This question will be answered under the two following heads.

Need of repetition according to the active school, because it excites greater interest.

§ 175. (α) Repetition often excites and gratifies the interest of the soul in the objects perceived, and thus arouses and fixes the attention upon them with greater energy.

In single percepts.

This is illustrated by the example of many single percepts. A color or sound gives pleasure when once perceived.

Let it solicit the mind's notice a second time, and the remembrance of the gratification which it gave will arouse the mind to attend with increased energy to the object which had previously imparted so pleasant an experience. In the recollection of that experience, and with the

hope of its renewal, it renews again all its energy of perception. The result is a definite remembrance of every thing which the man is competent or prepared to know in respect to it. When the attention is solicited again, the mind at once responds to the call, withdraws its divided or distracted activity, and, according to its sense of the value of the good to be enjoyed, responds with an energetic and attentive gaze. Each new look reveals some new property or feature unknown before, and with it comes some new enjoyment, the recollection of which stimulates to renewed attention, till the soul is satisfied that all that can be known and all that can be enjoyed has been exhausted. By this time, however, the object has been so attentively considered that it cannot be lost.

The same law operates in the apprehension of things, or of many percepts united in one. Let it be supposed that the perception of these in their relations gives special pleasure, and the same result will follow as in the perception of single objects. The mind that is delighted by a masterly combination of sounds, or a blending of colors, or mixture of tastes, or contrast of touches, will repeat the perception of these combinations with increased interest and increased attention. The perceptions gained by the energies thus stimulated, will be certain to remain.

If the percepts are gained by different senses, as in those combinations which we call things or objects, the same law will hold good.

It often happens that the objects which solicit our attention excite no special interest in themselves, and yet some feature or features in them attracts the attention, because of some relation to objects in which we are especially interested. Thus, a hundred faces in a crowd, a hundred trees in a wood, a hundred horses in a drove, remind us of nothing about which we care. We give to each and all an uninterested glance; there is no energetic perception, and of course no definite impression. None are noticed, and all are forgotten.

But if a single one pleases us, because it brings up the thought of any object which it is pleasant to think of; if it even attracts our attention sufficiently to inquire whether it is like or unlike that which it is pleasant or unpleasant to remember, we shall so attend to that one as to retain what our perception gives.

Repetition more essential for the mastery of large and complex objects.

§ 176. (b.) Repetition is still more essential to enable the mind to unite into a whole the separate parts of objects which cannot be grasped by a single act of perception. The examples already cited, belong to those objects which require but a single act of attention in order to be completely possessed by the mind. There is a very large class of objects, however, which consist of too many parts to be known by a single effort of perception. These must be combined together into one, *by successive acts*. For example, if we perceive a mathematical figure with a very irregular and complicated outline, it is necessary that we view it in separate portions, in order to master the whole. Not only is this true, but we often need to review each portion which we have already perceived, in order to connect it with the part which was previously perceived. After we have followed the outline by repeated acts of observation, we need often to review the whole, as a whole, by a rapid succession of acts, or by a single glance of the eye, to unite the sev-

eral parts. If we look at a painting, we study its several parts, perhaps for hours together, in order to gain and carry away a distinct and satisfactory impression of the whole. If we look at the front of an edifice that is elaborately adorned, we follow the several features one by one in their order, often returning upon our course, that we may retain the perceptions which we have gained.

Some objects are beyond the natural limits of the soul.

The office and the necessity of repetition in all these cases are peculiar, and require special explanation. We observe, first, that in the cases supposed, the object is too extensive to be perceived by the mind in a single act. There are spatial and numerical limits to the mind's power to perceive distinctly.

If the object within this limit is very simple, it may be mastered by a single effort. But if it is complex, and consists of many separable or distinguishable parts, it becomes necessary to use repetition, not because the space is too extensive to be distinctly perceived at a single effort, but because the number of objects is too great to be separately contemplated together by any single act.

The first perception often a mere effort of discovery and selection.

But why must the observer give a second look to the parts which he is competent to observe at a single glance—for example, to objects within a limited space and of small number—and often many repeated looks, in order to unite them into a completed impression? Why must the eye run again and again along the outline of an irregular and extended boundary, or over the face of a large edifice, before it can fix and carry away a definite impression of the whole? The general answer to the question is, that it must do this for two reasons: first, in order that it may seek out and discover what it can find; and second, that when it has discovered what is there, it may determine what it will select as worthy of those efforts of attention which are requisite for a complete and permanent perception. The first efforts of the eye upon such an object are like voyages of discovery or movements of military reconnoissance. They serve the same purpose as the use of the finding-glass of a telescope. The eye runs hither and there with a vague and quickly-shifting gaze. It finds one feature after another which excites its interest and attracts its attention, and thus learns in a general way what material is present for it to work upon. After this preliminary work, a second and still another look may be required, that the mind may determine which of these parts it is worth while to unite together into a continuous and connected whole, by successive acts of attentive perception. That this view is correct, is manifest from the difference which we notice between observing a complex object when seen for the first time, and when it has become familiar by repeated acts of perception. If the object is new and strange, we must view it again and again in order to bring away any distinct perception. If it is familiar, or like a familiar object, a single and hasty look is often enough to secure a clear and permanent knowledge. In such a case we know beforehand what we expect to find, and to what points we need to direct the eye in order to assure ourselves. If parts of the objects differ slightly from those previously perceived, or those which we expect to find, these are noticed at once, and the new perception is corrected accordingly. In the other case, we do not know beforehand what we are to find, and we must use repeated efforts in order to determine what there is to be found, and what we will select as worthy of preservation.

Very large and complex objects require repetition.

When the object contains a greater number of parts than we can grasp at a single view, there is need of repetition for another reason. Let the outline of a mathematical figure be made up of many sides, or the face of an edifice consist of a very great number of salient features, and it is impossible—let

either be ever so familiar—that they be perceived distinctly by any single effort of perception. The eye must pass around the outline, or sweep across the face by successive acts, and master each portion in detail, in order to perceive the whole so as to recall it. Such objects

are perceived in parts under the law of natural limitation to which the senses are subject. They must be recalled by successive acts, because they can be recalled only in obedience to the laws of those relations under which they are originally perceived. To fix these connections, attention is necessary. In order to know what these relations are to which it is desirable successively to attend, repetition is required.

In surveying large objects, or those which are very complex, repetition becomes necessary for the double purpose of fixing in the memory the parts of which the object is composed and of so connecting together these parts in a continuous whole, that they can be revived in succession, under the laws of association.

Here again we notice a striking difference between objects that are regular and uniform, and those which are irregular and multiform. Of two figures of fifty sides, let one be a regular and another an irregular polygon. Let the

façade of a building be made of similar parts combined after a uniform law of recurrence and symmetry; or let the parts have no relation of likeness, order, or correspondence. A few repetitions of attention enable us to master the one; very many are required to put us in possession of the other. In the case of the regular object, we first perceive that the parts are arranged in a certain order which is repeated—either exactly, or with inconsiderable deviations. To learn what this order is, may require several consecutive acts of close attention. But when this order is learned, and the elements of each group are discerned, the mind is in a condition to recall the whole, by its mastery of a single series of the parts. If the parts of the object are arranged in no discernible order, especially if they are very numerous, they must be apprehended in detail, a few only together. These few must then be connected with the adjoining group by another attentive act, and so on till all are perceived, and the mind is in a condition to recall the whole.

Fourth condition of successful perception is familiarity.

§ 177. (4.) *Familiar objects* are readily and rapidly perceived. Novel or unfamiliar objects are slowly and painfully mastered. The fact is unquestioned. The explanation of it is furnished by the principles which have been already laid down.

Familiar objects, either single percepts or combinations of percepts, are such as have been often distinguished from others. When the constituent percepts are familiar, as shades of color, sounds, forms, touches, tastes, and smells, the mind is ready to attend to them and to know them with little effort, being guided in directing and fixing its attention by its remembrance of what it had perceived before, and incited to attention by remembered pleasure. If the combination is also familiar—i. e., the union of the taste or smell with the color, or the touch with the form—the same law holds good. In looking at an individual chair or table which I have often perceived, or the aspect of which is familiar, one percept prepares the way for the other—the color for the form, the form for the weight; one part for another, as the leg, for the back of the chair or the bed of the table; so that the mind is at once prepared for what it expects and readily apprehends what its attention is waiting for.

But let the object be unfamiliar, we are detained upon its parts in the way already explained, in order that we may discover what they are, so far as to decide which, if any, shall receive our attention. If a novel piece of furniture is seen, or a new implement, or an edifice singularly planned, or a work of art executed after peculiar principles, or if an animal or plant of an unfamiliar species or a dress of a new fashion, are presented for our inspection,

we find it necessary to look again and again at the object. We must feel our way *step by step* and part by part, to find the parts of which it consists, so that we can recall them.

§ 178. The acts of repeated perception which are required in such cases, are not to be confounded with acts of recognition, or acts of comparison for the purpose of discerning similarities or other relations.

Acts of recognition and of comparison do indeed usually accompany these efforts of perception. But though they often facilitate, they do not constitute the acts. This is manifest from the nature of the case. A single percept, and an object consisting of several percepts, must first be perceived in order to be recognized. It must be known the first time, or by a first act, in order to be known the second time, or by a subsequent act. So, two objects must be perceived, before they can be compared and discerned to be similar or alike.

Recognition and comparison accompany perception, but they are no parts of the act. They greatly facilitate the act, but they do not enter into the act itself. Perception is developed along with these higher activities. The higher activities, in their turn, stimulate and guide the lower. The perceptions of the infant—and often of the cultivated—are limited, because the range of its recognitions and comparisons is narrow. But within this range they are often more acute and discriminating, because they are concentrated upon fewer objects, and are disturbed by fewer distracting questions of sameness or similarity. The child and the hunter, the sailor and the fisherman, have sharper and acuter vision than the adult and the philosopher, not merely because their organs of sense are in higher physical perfection, but because they are practised upon fewer objects, and the mental force of attention is fixed with greater interest, and therefore concentrated with greater energy. On the other hand, the educated man often sees in the same object, and even with the eye of sense, much more than the child or savage can see, with his acuter bodily organs, simply because his wider range of knowledge prepares him to look for more, and to appreciate it when it is presented.

Some psychologists distinguish perception from sensation thus: 'a sensation, when recognized as similar to one previously experienced, becomes a perception.' So Herbert Spencer: "As there can be no classification or recognition of objects without perception of them; so there can be no perception of them without classification or recognition." "A perception of it [an object] can arise only when the group of sensations is consciously coördinated, and their meaning understood." "The perception of any object, therefore, is impossible, save under the form of recognition or classification." *Principles of Psychology*, § 46. London, 1885.

Morell says: "To perceive a thing, means, first of all, to recognize it;" and again: "When we come to perceive special objects, then it is implied that we not only recognize, but that we also begin to classify them."—*Introduction to Mental Philosophy*, pp. 85, 86. London, 1862. That this is really impossible and logically self-contradictory, is obvious from what has been said. Recognition and classification attend and assist perception, but they do not constitute the act. It is obvious that this definition would exclude from the act of perception-proper, all that is material to it, or by which it is distinguished from sensation-proper, viz.: the apprehension of spatial relations and of externality. Neither of these are necessarily involved in the recognition or comparison of sensations. The view would limit us to a purely idealistic theory.

§ 179. (5.) To complete and successful perception, some continuance of time is necessary. The necessity for time is partly physical or organic, and partly mental or psychical.

The organic necessity lies in the unexplained and ultimate fact, that in order to a complete and definite physical impression upon the organ, there

Continuance of time necessary for successful perception.

must be a continued action of its excitant or stimulus for a brief but appreciable period. The eye and the ear, and the other organs, with their connected nervous apparatus, must be occupied with that which excites them, in order to give a sensation of which the mind can avail itself to distinct perception. Indeed, after the stimulant has ceased to affect the organ, the sensation, and with it the perception, remains, as is evident from the experiment by which we revolve a burning coal so swiftly as to perceive a circle of fire. These after-sensations, in many abnormal conditions of the system, are ludicrously and fearfully conspicuous in their effects, and produce spectral illusions and hallucinations in manifold varieties. All that we need notice here, is the possibility that a sensation may continue after its excitant is withdrawn.

The psychical necessity is obvious from the fact that the mind can remit or increase the energy of the organ by its own voluntary agency, and that, to exert this energy, also requires time, if for no other reason, because the mind acts through and under the laws of its physical organism. An increase of energy in a part or the whole of the organism is an affair of time, and is often a measure of its lapse.

In those acts by which several percepts are connected and combined, time is also required. If the mind cannot master a *single* percept without *continued* attention, much less can it connect *several* under any common relation without requiring an appreciable portion of duration. Whenever the mind must not only attain a definite apprehension of the separate percepts, but must regard them as related together; to each of these attainments, and to all united, a continued effort is necessary, and a considerable period of duration.

Jugglers, prestidigitators, etc., perform many of their feats by having acquired a capacity of rapid movement which does not allow time enough for the sense-perceptions of lookers-on to respond to the objects. Often they do not furnish time enough for the requisite impressions to be made upon the sense-organs. Still more frequently they do not furnish time in which perception or intelligence may perceive the objects in their relations, so as to discriminate, construct, and interpret what the sense-organs respond to. Quickness of movement and quickness of thought are the prime requisites for a successful juggler. To this should be added the capacity to divert the attention by lively sallies, by sudden gestures, rapid speech, exciting tones, and a bold address, as well as skill in inventing the physical appliances of illusion. A man endowed by nature with aptitudes like these, who has learned to make them efficient by art, can almost cheat the eyes and ears of the soberest and most practised observer.

Feats of jugglery involve quickness of movement.

§ 180. It is in place here to consider the doctrine which is insisted on so earnestly, particularly by Dugald Stewart (*Elements*, c. ii.), that the mind, in perception, can attend to but one object at a time. This position he endeavors to sustain and enforce by examples like the following: In viewing a mathematical figure, say of a thousand sides, we view each side by a separate effort of attentive regard, till we have passed around the outline by successive acts of perception. The eye and the mind do this so rapidly, that when the outline is not very complicated, they seem to grasp and master the whole by

Can we attend to more than one thing at a time?

a single and instantaneous act. So, in listening to a concert of music, we think we hear—i. e., attentively listen to—all the instruments and separate parts together, whereas we in fact can attend to but one. When we seem to ourselves to listen to all, we in fact pass so rapidly from one to another as to think we attend to all together. When Stewart is called to explain what he means by a single object, he defines it, in connection with the eye, as the *minimum visibile*—that is, the smallest extension of color or shaded light by which the eye can be affected. In respect to the ear, he ought, by a similar rule, to assert that the *minimum audibile*, or the simplest and shortest appreciable sound only, can be attended to at a single instant.

The theory of Stewart labors under the following difficulties: It excludes the possibility of comparing objects with one another. In order to compare objects so as to discern that they are alike or diverse, they must be considered together—that is, they must be attentively perceived in combination. We cannot see that two surfaces of color are alike or unlike, without perceiving them both in connection, and perceiving them both by a single attentive act. In the cases supposed by Stewart of the several sides of a complicated outline, or the separate sounds of the instruments in an orchestra, the parts of the figure must be considered together, to be known to be adjoining, near, or remote: the separate notes or sounds also must be heard together, to be discerned to be alike or harmonious, to be known as higher or lower, or to be connected as before and after one another. It is obvious that the mind can apprehend more than a single object at once. If it could not, it would be forever and entirely cut off from the most important part of its knowledge, viz., the knowledge of relations; which knowledge can only be attained by the apprehension of at least two objects together.

Attention to an object and its image.

It may perhaps be said, that what Stewart intended to assert was this: that in *sense-perception* the mind can only attend to one object at the same indivisible instant; that in those cases in which it compares two objects, it connects an object perceived with an object represented, a percept with a representation. For example, in viewing a complex outline, or hearing the sounds of an orchestra, it sees at a present instant a single side or the smallest possible part of a side—the *minimum visibile*—or hears a single sound or note, and, while seeing or hearing, compares with it the side just seen or the sound just heard before. But in order to do this, it must apprehend at the same undivided instant of time both the side which is seen and the side which is remembered. The doctrine that the mind can apprehend or know but a single object at a single instant of time, must be abandoned as incompatible with all the higher functions and acquisitions of the soul, as well as with the most obvious facts within our experience.

The mind can attend to more than one thing at a time.

But it is not true that, in sense-perception even, the mind can apprehend but a single object at a time. The mind must be able to apprehend more than one object of sense, because its attention is so readily turned from one to another. Among many objects

that are equally before its gaze, it singles out one, concentrates all its energy upon it, and then suddenly leaves it, fixing on another; and so passes from one to another with a rapidity that surprises itself. This it could not do unless it were able to apprehend many objects by a vague perception of their existence. The single fact that the eye can perceive a wide extent of space, viewing all parts equally well, compels us to believe that this extended object, containing many within its limits, is apprehended by the mind as made up of many parts, and that these parts, or single objects, can all be seen by a single act.

Can the mind use the utmost attention upon more than one object? But can the mind use the utmost energy of attention upon more than a single object of sense? This question, if it could be answered satisfactorily, would give but little satisfaction to the mind, for the reason that it very rarely happens that the mind, in perception, employs its utmost energy of attention. It scarcely ever happens that single objects, in the sense of *minima visibilia*, or *minima audibilia*, are perceived at all. The smallest possible percept rarely occupies the attention. Then again, the mind rarely, if ever, puts forth its utmost energy. Attention is an affair of degree, which varies with each condition or status of the soul. If, then, it were theoretically true that the utmost conceivable energy of attention must necessarily be fixed and concentrated on the smallest possible percept, the supposed case would never occur in fact. It might be true, notwithstanding, that great energy of attention could be fixed on two percepts, or even on more than two material things.

The material point to be decided is, whether the mind can at once apprehend or attentively know more than a single object. This being decided in the affirmative, all other questions are of little interest. It is enough that we are certain that objects cannot be effectively known except they are known in their relations. To the knowledge of relations, the knowledge of at least two related objects is necessary. To successful or permanent knowledge, even of relations, attention is requisite. The mind must then be able to attend to more than a single object. Inasmuch, also, as by far the most important of our sense-perceptions are concerned with the union of percepts either of the same or different senses, it follows as highly probable, if not as absolutely certain, that the mind can attentively perceive more than a single percept. Whether the mind, in the same act of perception, can or usually does attend with equal energy to each of several percepts, is a question which might be prosecuted with some show of reason. When we view two or more objects together for the purpose of comparing them, and strain the mind to its utmost energy, the excess of energy is directed now to one and now to another. Both are attended to, but not with the same intenseness. This is ordinarily observed to occur. The mind regards one object with more attention than the other, in order that it may receive a vivid and distinct impression of it, and then compares or in some other way connects it with that received from the other. When this is done, the process of comparison or connection is complete. This fact or phenomenon has given occasion to the unwarranted and impossible inference, that the mind can attend to but a single object at the same indivisible instant.

CHAPTER VIII.

ACTIVITY OF THE SOUL IN SENSE-PERCEPTION.

THE foregoing analysis of the process of sense-perception into its constituent elements, and its successive stages, has assumed that, so far as perception is an act of knowledge, it is essentially active. So far as the analysis has shown itself to be correct, so far may it be considered as an indirect argument in support of this assumption. The correct doctrine in regard to this subject is, however, so important, not only in its relation to the nature and the trustworthiness of knowledge in general, but also in its special bearing upon the higher functions of the soul, as well as upon a correct theory of the nature of the soul itself, that it deserves and even requires a separate discussion. Inasmuch, also, as the special form and results of perception depend very largely upon what are called the active powers of the soul, viz., the appetites, the emotions, and the will, we embrace within our discussion a recognition of the influence of the springs of action upon the intellect. For this reason we have adopted for the title of this chapter, 'the activity of the soul in sense-perception.'

Sense-perception
held to be pas-
sive only.

§ 181. The impression is very common, that the soul, in its sense-perceptions, is simply receptive of material objects—that it passively receives or submits to whatever impressions are imprinted upon it from without, exerting no active agency of its own.

By many, this impression is stated as a positive doctrine, which is consistently carried out into all its logical inferences and applications. Thus Kant and his disciples, as well as many psychologists not of his school, assert that the soul, in sense-perception—as indeed in all the intuitions of consciousness—is simply receptive, while in the higher functions of thought it is self-active. So far is this doctrine carried, that a distinction is made between the forms of intuition on the one hand, which are called receptivities, and made to pertain to the passive nature of the soul, and the forms of thought on the other, which are supposed to belong to the soul's active energy.

Psychologists of the materialistic school, and many who are not materialists, but are more or less influenced by forms of expression and habits of association that are borrowed from materialistic theories, not only assert that the mind is passive in its sense-perceptions, but even in the higher activities of imagination and thought. Locke often inadvertently expresses himself in language and by illustrations and analogies borrowed from the physics of his time. Condillac not only makes all sensations to be impressions imprinted upon the *ta'ula rasa*, but makes all ideas, or the intellectual copies of sensations, to be simply 'transformed sensations.' With him agree in principle the ideologists of the French school. The schools of Beneke and Herbart in Germany, as also Herbert Spencer and his disciples in England and America, all formally accept and positively teach the same doctrine, or unconsciously assume it to be true in their theories and discussions.

Grounds on
which the theory
rests.

The grounds on which these theories and assumptions rest are the following: 1. The general misconception of the nature of the soul, and the powers and laws of its working, by which it is invested with material properties, and interpreted by mate

rial analogies. This misconception has been already explained and discussed sufficiently, and needs no further elucidation (cf. § 25).

2. The unquestioned fact, that the soul, in sense-perception, apprehends and acts by means of a material organism, and has to do solely with material objects. This fact cannot be disputed. It is not surprising that the inference should be derived, that that which acts by means of matter as its instrument, and upon matter as its object, must itself, at least in these classes of its activities, follow the laws of matter so far as to be capable of action only so far as it is acted upon, and to depend on matter not only to arouse it to action, but for the degree of energy to which it can be excited.

3. The soul is known to be entirely dependent on matter for the objects which it perceives. It cannot perceive any material object when the object or stimulus does not exist. Moreover, the efficiency of the material organ or instrument which it employs, depends on the material conditions which are required for healthful and vigorous activity.

§ 182. We maintain that in sense-perception the intellect is active, and for the following reasons: The soul, in sense-perception, is known through consciousness to be active, and in a special sense to be self-active. To perceive by the senses, is only a special form of the soul's general capacity or power to know. To know, is not to receive or suffer an impression, but to be certain of a fact; and whatever may be true of the objects which are known, or of the instrument or conditions by which these objects are brought within the reach of the mind's activity, these do not in the least affect the nature of the activity itself. So far as this function is exercised, the soul is simply self-active, and as truly so as in those higher functions in which the objects and conditions of this activity are only spiritual (cf. § 46).

To know, is not only to be certain of existing facts or realities, but it is also to apprehend these facts in certain relations. The facts or beings known differ somewhat in their nature in different kinds of knowledge; in the case of sense-perception, these beings are material. The relations apprehended differ according to the kind of knowledge; to the knowledge of matter, a limited class of relations only being essential. But knowledge is knowledge, whatever may be the nature or extent of the facts or relations which are involved and required. To apprehend the existence and the relations of sense-objects, must of necessity be an intellectual act, and it may involve an active process. It cannot be conceived or defined as a state of passiveness or receptivity only. Its conditions may involve reception and suffering in some stage of the process. The preparation of its objects may involve the subjection of the sentient organism, and of the soul which animates it, to material forces and laws; but the acts or processes by which the objects thus presented are known apart or are united, are active, and active only. They cannot be conceived as any thing besides.

§ 183. That the soul is active in sense-perception, is evident from the following facts, most of which have already been noticed. The power of the intellect to perceive any objects of sense is developed by degrees in the mind of the infant, and,

That the soul is active, is attested by consciousness.

Its activity is developed by degrees, and to varying perfection.

after it is fully developed, is exercised at different times and by different persons with a greater or less degree of energy. Different persons also acquire, by special discipline, what may be called a special power to perceive certain classes of objects; which special power is exercised with varying energy and effect on different occasions. The rapidity and perfection with which this power is or can be exercised, depends on the energy of attention with which it is applied to its objects. Now, attention is a varying condition of activity, and is possible only of those states which deserve to be called the active, in distinction from the passive conditions of the soul. If the soul can attend in its sense-perceptions, it must be active in them.

Attention the condition of success and progress.

The infant begins to perceive when and so far as it begins to attend. So far as we can judge from observation, or can remember by looking back over our own childhood, or are authorized to infer from analogy, we conclude that the soul of the infant is at first in a condition in which sensation greatly predominates, with only the feeblest exercise of intelligent perception. The infant at first feels many sensations, but it can scarcely be said to know objects at all. In other words, it only perceives, with the lowest activity possible of a power undeveloped by exercise. It is only when its attention is aroused and its power to know is acquired and fixed, that it is properly said to perceive. Its attention is first limited to the objects of a single sense. One after another, each of the senses is awakened to action, and, as each is aroused, the mind seems to bestow for the time the whole of its energy upon the world which a single sense unfolds before it. It studies light, it studies colors, it studies forms, it studies sounds, it studies touches. Soon, in connection with the movements of its body, it learns to apprehend the relations of space, viz., position, distance, and dimensions. It then gathers its percepts together, locates them together or apart, attaching them to their appropriate places or objects. Then it uses one class of percepts in place of another, or as signs of distance, size, etc., in all the varieties of acquired perception.

As the mind passes through each of these stages of its early development, it concentrates its energy upon definite and appropriate objects. Upon the infant's eye, as physically receptive of light, color, and form, the same landscape is painted as that which is mirrored on the eye of the man; but how much more does the man perceive than the child. Sounds, smells, and tastes solicit in vain the apprehension of the one, which are answered by the quick perception of the other. Or, if they are distinguished by each, to the mind of the one they indicate far more than to that of the other. The one perceives in them the various wealth of signification which they suggest; to the other, they signify nothing.

Differences in the perceptions of the same and of different men.

§ 184. As real and as great a difference is to be observed in the perceptions of different men and in those of the same men at different times. We suppose that the power to perceive is fully developed in each, and notice the difference which is made by the energy and direction in which different individuals exert the power at any moment. Two persons look out upon a landscape, but how much more does the one behold than the other. One sees countless objects which the other entirely overlooks—houses, trees, lawns, lines of beauty, contrasted and varying colors, artistic groupings, none of which are observed by the other. Numberless sounds await the notice of each. One

hears, the other fails to hear the crowing cock, the sharp report of the rifle, the rattling and rumbling of distant vehicles, the cawing crow, the singing of birds. The same is true of the percepts of taste, smell, and touch, though in a manner and to a degree less striking. (Cf. "Eyes and No Eyes," in *Evenings at Home*.)

A striking difference is discernible by every individual of himself in the perceptions which he forms of the same object at different times. In a certain mood, through listlessness, a few objects attract a feeble notice, or secure an answering regard. At another time, the wakeful eye and mind gather in from the same field, before so barren, a myriad of percepts that had remained unnoticed. They throng in upon the excited and aroused attention with surprising rapidity and profusion. Even when the mind is most wakeful, much is left unperceived, from want of time or interest. We might spend hours in gazing into a single tree, and not exhaust its wealth of material. After viewing an extensive landscape closely for hours, when we turn from it, we leave behind and unseen far more than we have perceived and brought away.

Facts like these prove decisively that perception is more than the passive reciepience of imprints from without—that it involves an active coöperation from the spirit within. They show that each man's perceptions are what his own activity makes them to be—that they are a product of the excitements furnished by material nature and the mind's own energy.

§ 185. The methods in which the soul exerts its energy are various. The soul imparts special energy to single organs, so that they perform their functions with more than usual efficiency. It does this by determining a flow or excitement of the nervous power to the eye, the ear, or the hand, thereby rendering each capable of a more vivid sensation. This process and this effect are both called the *innervation* of the organs. It is accomplished, in all probability, by the medium of the *reflex* or *efferent nervous* organism. Whatever may be the physical or physiological medium by which the effect is produced, its cause is psychical; the soul itself is the originating agent.

This innervation of a single organ or pair of organs is observed in cases like the following: The eye rests listlessly or wanders vaguely over a landscape or a crowd of men. In a moment it is fixed by some single object, perhaps through some physical stimulus, as a bright light or glaring color; perhaps by something attractive only to the feelings. The curiosity is aroused, and stimulates the organ to do its utmost. Under the innervation of the agent of vision, the picture which had before been painted dimly on the retina, is suddenly lighted up as though a new force of sunlight had poured upon the object a fresh illumination. In a similar way, the soul can awaken the ear to more distinct hearing, by summoning its physical capacities to do their utmost. 'Did you hear that shriek?' says one man to another. The ears of both are made attent at once, and are physically excited, to catch even the feeblest sound, as well as mentally to interpret its meaning.

Partial suspension of certain organs.

That the soul possesses and uses this power, is evident still further from the fact, that, in order to increase the energy of single organs, the mind is often forced to suspend the action of the others. We close the eyes, that we may hear distinctly a doubtful call, or mark the faint ticking of the clock, or do full justice to the skill and power with which a superior singer manages delicately

shaded sounds. We find it difficult, and sometimes impossible, to give full effect to two of the senses at the same time. We cannot at the same instant read the degrees from a measuring scale, and listen to a musical air.

§ 186. The mind exercises its activity in its sense-perceptions, by directing its attention to a limited number of sense-objects, and neglecting the remainder.

The attention
fixes upon selected
objects.

The mind, as we have seen (§ 176), in one act of apprehension can be occupied with only a few objects, whether they are objects of sense, or psychical creations. To do justice to those objects, so as to bring away distinct and vivid images of their being and relations, requires that they be exclusively before the mind. If they are exclusively present, other objects must be excluded, shut out, and neglected. We have also seen (§ 179), that, in apprehending objects of sense, an additional reason for this exclusive occupation is found in the fact, that a prolonged occupation of the organ with its object is required in order that the physiological conditions for a definite impression may be fulfilled. The fact is unquestioned, that the mind does both admit and shut out the objects of sense by its active efforts.

If we notice and follow our own processes in sense-perception, we shall observe that we are constantly employing our energies in this twofold way. When, for example, we listen to a full orchestra, we may single out the flûte, and follow its shrill piping with a distinct and delighted apprehension of the melody, in spite of the crashing masses of sound that assail the ear from trumpet, trombone, and drum; or we trace with rapt and absorbed devotion the silver threading of the leading violin along its sinuous course; or we combine into a single and almost exclusive impression the sounds which the stringed or wind instruments make together; or we give the ear to a single part as rendered by its appropriate agents, soaring and floating with the air, or inspired by the animating tenor, or gravely sympathizing with the bass, leaving, in each instance, all the other parts unheard. The power of the mind *not* to perceive or *not* to notice, is illustrated by examples like the following: The miller does not hear the sounds from his own mill, while the visitor can hear nothing else. The factory operative does not notice, and therefore is not disturbed by the whirl of the spindles and the clash of the looms. He can speak and hear with entire freedom, while the bystander can do neither, from the distracting and deafening din.

§ 187. The activity of the mind in sense-perception is still further illustrated in the great variety of acts and processes which we are distinctly conscious that we are compelled to perform, in order to create percepts and images which we can carry away and retain. These acts and processes are acts of selective analysis and constructive synthesis, by which the soul chooses for itself the objects which it will separate and remember as distinct objects or things. These objects, when formed and made familiar, can be recalled and recognized by the memory, and recast by the imagination. They people the dream-world, they crowd upon the phantasy, they illustrate general conceptions, etc., etc.

Activity shown
in selecting and
combining sense-
objects.

When we are confronted with an object wholly strange and new, we

often find ourselves making distinct efforts in studying it part by part, and then still others, that we may unite the parts together into definite products. Even when the eye is introduced to a new landscape, it first runs with rapid glance along the horizon, resting here and there upon any point or feature which invites a prolonged or second look; then it sweeps hither and thither, crossing its track as often as need be, searching out whatever may attract its gaze. After having thus constructed the outline of the picture, it leisurely paints in the details one by one, till the whole is finished, and it can carry away the remembrance of it as a single object; or perhaps it divides it into separate portions, and treasures in the memory cabinet pictures of selected parts. But how much does the most careful and active observer overlook! How little does he notice and remember of the grace and beauty which is spread out before him! How much is hid and overlooked, to the most attentive and the best-trained eye! How much is reserved for after-efforts!

The recognition of this activity is important for the explanation of imagination and memory.

A recognition of the activity of the mind in perception is of the greatest importance to a right conception of the nature and conditions of acts of memory and imagination. The mind can re-create by the representative power only what it has first created by the power of perception. The memory and imagination can recall and reshape no more of the objects of sense than the perceptive power has shaped and fixed and carried away for the service of both. The acquisitions of the memory and the reach of the imagination do not depend so much upon the number of objects which we have perceived, as upon the manner in which we have perceived them. It is not merely what is brought to the notice or within the reach of the senses, but what the mind actually and effectually so works upon as to place it at the service of the power to recall and re-create. This we know to be true in fact, by experience and observation. There are times when we seem to perceive the greatest number of objects, and with the most excited interest, and yet of them all we can recall but a few, and these but vaguely. The wealth of material sometimes wearies and distracts the power to appropriate it.

Why this should be so, will be fully explained when we consider the conditions and laws of the representative faculty. A general statement of these reasons may be thus expressed: The secondary activity of the mind in recalling or re-creating must depend on its primary or original energy in perceiving and acquiring. The action of the mind in remembering and imagining is wholly spiritual and subjective. It would seem that its conditions and laws must be found in that element of sense-perception which also is spiritual and subjective.

This activity in selection and combination shown in early life.

§ 188. The activity of the mind in sense-perception is required in early life to separate the mass of perceived or perceivable material into the distinct objects which are apprehended and named by men of average intelligence.

We have already seen that the work of thus uniting different percepts into distinguishable wholes is performed to a great extent before the time when we can distinctly remember. To the infant's eye the whole world of perceivable matter, so far as it is perceived at all, is perceived as a single whole, or one undivided object. The apartment within which it tries its first experiments of activity is literally a universe; the walls, the ceiling, the table, the chairs, all blending together in a total impression

This whole is soon divided into parts. Those objects which are readily moved, are first separated and viewed apart by a natural and necessary process; those which are fixed and stationary are afterward divided to a limited extent, according to accident or individual caprice, but more commonly by certain considerations of convenience, that are universally recognized. The chair, the table, etc., etc., are easily known as separate objects, because they are often moved, and thus, as it were, broken off from the rest of the apartment. At a later period, the floor, the ceiling, the walls, and other immovable objects are so distinguished as to be recognized and named as diverse and separate objects.

To accomplish and perfect this work of construction and separation during infancy and childhood, there is required the repeated application of the attention to distinguish the parts, and of combination in order to unite them into wholes. In these efforts the mind exerts its spiritual activity, as is evident from the fact that one mind performs its work far more rapidly than another, thereby showing that what is perceived depends on the quickness, energy, and sagacity of the individual. One mind does this with greater perfection than another. Its discriminations are more subtle, its combinations more exact, and its interpretations more sagacious, even upon such objects as apples, oranges, chairs, tables, horses, and dogs. These differences may not appear in the application of the common names of common things, but the *perceptions* and the *percepts* of the two, as mental *acts* and *products*, may be very unequal.

The same activity continued in mature life.

The process which is slowly acquired in infancy and childhood, and with unequal perfection and dissimilar results, is continued in mature life. The mind, when adult, is governed by the same laws, and follows the same methods which controlled its processes in infancy. A multitude of objects every instant solicits its attention. It perceives those, and those only, to which it yields that attention. It enlarges the circle of its perceptions by those only which it subjects to its power. Those which necessity, convenience, pleasure, duty, or an active curiosity excite us to regard, receive our notice, and are soon familiarly known to the mind. But the greater portion of that part of the visible and tangible universe which is within the range of our organs, is to the majority of men almost entirely unperceived; it is the unexplored background, against which the few familiar objects are projected. Out of this material more observant and curious eyes are continually shaping new creations. But what each perceives is what each individual so creates and shapes that it carries it away as a permanent image. In this work of active construction, the intellect is busied, from the first essays of unremembering infancy, to the most mature and exact observations of unforgetting manhood. It begins this work with retaining and repeating the perceptions of a single sense. After mastering and securing the products of each of the senses in their turn, it proceeds to unite them into completed wholes, fixing and familiarizing the relations of form, of distance, and of relative position, till the mathematical eye and the mathematical touch are severally perfected, and trained to act in unison. In this way the perceptions of familiar objects, one by one, are formed and fixed. They are, at the same time, more clearly distinguished from the perceiving mind itself as the *non-ego*. The more compactly they are, so to speak, crystallized into separate existences, the more sharply are they contrasted with the percipient mind, and the more boldly do they project into that relief which is possible by the relations of space. These processes are perpetually repeated till the end of life, greatly facilitated in respect to ease and precision by the acquisitions of earlier years, but never ceasing to be repeated upon the unwrought material, which the percipient mind creates while it perceives, and perceives no further than it creates.

Differences in
special activities
of adults.

§ 189. This activity of mind is more conspicuous in the diversity of the sense-perceptions which are reached by different men as they advance in life, or differ in their employments and culture.

A single general example may illustrate the diversity of perception in which all these causes exert their influence. Let two men together inspect a complicated machine or engine; let the one be a person of average knowledge and experience, and the other an accomplished engineer: how much more will the one perceive in the engine than the other. Before the practised eye, each separate part takes its appropriate place, being sharply distinguished from every other, the dividing surfaces and connecting members being all discerned at a glance, and all these separate portions being bound into a complete and symmetrical whole. To the eye of the uninstructed person, however keen may be his physical vision, there is neither whole nor parts, but a confused and bewildering impression. The difference cannot be accounted for by any physical defect or excellence in the organs of vision, but only by the previous mental and intellectual training. But these do not enable the person to dispense with the use of the organs of vision. They do not themselves perceive. They simply direct the use of the organs in such a way that distinct perceptions are gained by the one person, while of these perceptions the other fails altogether.

These intellectual conditions are the result of the mind's own energy, and the fact that they are needed is most convincingly demonstrated by a multitude of similar cases. The sharp but uninstructed eye of the child or the savage looks out listlessly upon the stars; the reflecting eye of the astronomer groups them in figures, threads them upon lines, and arrays them in mystical curves. The mechanic perceives much that every other man overlooks, and the objects which each mechanic perceives, or, as we say, has an eye for, depend on the particular trade to which he has been trained. The same is true of the architect and of the painter. It might, perhaps, be thought that the activity which is exerted in all these cases is an activity of the fancy, of the memory, and of thought, and that it is improper to speak of it as an activity of sense-perception. It is true that there is an activity of fancy and memory which attends and often precedes this special activity of sense. But if the memory and the fancy are first aroused, their action determines and decides what is perceived by the senses; it directs and holds the attention to their appropriate objects, and so enables the mind to master and retain them as permanent possessions.

This activity directed and stimulated by the interest felt in the object.

§ 190. It follows from these truths, by a necessary inference, that the mind's activity in perception, and its mastery over a greater or smaller number of objects, must depend very largely upon the interest which these objects excite. In other words, the feelings and the character affect the accuracy and the reach, and of course the permanence of the sense-perceptions. The eye sees and the ear hears the objects which the soul desires and delights in. It is not easy for the mind to perceive that which it dislikes to contemplate. On the other

hand, the objects which our interests, our profession, and our tastes prompt us to attend to, we discern with surprising readiness.

The eye that is sharpened by the lust of gain, detects objects and qualities to which the less interested observer is totally blind. The ear that is quickened by expectation or terror, can catch the sound of deliverance when all other ears are deaf. The hand that palpitates with hope or fear, can apprehend delicate monitions of good or evil, which the stranger would not notice. The living soul, as intellect, sensibility, and will, is present in the acts of every sense, and largely determines the report which each shall make of the material universe. What a man is, is exemplified in what he perceives. His tastes, his sense of character, his moral resolves and aims in life—all these are expressed in the quality and the quantity of the sense-perceptions which he creates and stores up from the infinitude of wealth which is spread out before him in the material universe.

§ 191. The activity of the soul in sense-perception, it has already been observed, is a limited activity. The process of sense-perception, in its widest significance, includes passion and receptivity as well as action and construction. We do not deny the first when we vindicate the last of these correlated elements. The soul cannot, by its creative energy, make that to be a mountain which is a cloud. It cannot make that to be, which in reality has no existence. It can, however, judge a mountain to be a cloud, and perceive a cloud when it might and ought to see a mountain (§ 48). The energy and direction with which it applies the power of knowing goes very far to determine what is perceived, how vividly, how perfectly, and how correctly. Nature must do her part in bringing the objects within the reach of the percipient. The sentient organism must be in a normal condition to secure the sensations to which the mind has become familiar, and on which it has been accustomed to rely in its acquired judgments, as it interprets the signs which nature presents. But when these conditions and indications are provided, the mind, by its own activity, determines what it perceives, whether it perceives vividly or faintly, how completely it masters and retains the parts of the object, and how correctly it interprets and combines together its elements and indications.

This activity is a limited and dependent activity.

§ 192. The activity of sense-perception, though it is an activity of knowledge, is yet the most elementary of all these activities, and the one which is most easily performed. In one aspect it is the lowest in the scale in respect to its dignity and disciplinary value. It is the least intellectual of all the intellectual acts. It is performed with great ease and with surprising perfection by the infant. All the manifold processes of combination and judgment which it involves are executed with the greatest rapidity, at the very earliest age, and by persons of the least cultivation in the higher discriminations of the intellect, and apparently of the very lowest capacity for such cultivation (of § 147). The habits and aptitudes which are the result of these efforts seem to be more completely controlled by association; to displace and almost to

is elementary, and easily exercised.

defy reflection more entirely than is true of the higher activities and applications of the intellect. That some activities and processes of the intellect are capable of being more readily performed than others, is an original fact of our being. It can only be accepted as a psychological fact, which, to our knowledge is ultimate and inexplicable (cf. § 54). But though this fact cannot be resolved by any higher or more comprehensive psychical or physical law, it is readily explained by the still higher relations of adaptation and design (cf. § 612).

SENSE-PERCEPTION: SUMMARY AND REVIEW.

§ 193. (1.) The processes involved in sense-perception, as our analysis has shown, are by no means simple. The product, when complete in a perceived material object, is in its constituent elements and relations more complex than is usually believed.

We will briefly review and recapitulate the several steps of the process and the elements of the product.

(2.) Sense-perception is an act of knowledge by means of sensations and the sense-organs. As the term indicates, the act implies two elements, which are distinguished as sensation and perception; more exactly as sensation-proper and perception-proper. These are distinguished in thought, but not separable in fact. The act of consciousness by which we know the process, separates these elements by an analysis of thought, but connects them by a synthesis of time relations, as constituting a single and instantaneous psychical state. They are distinguished in the relation of dependence, but are united as instantaneous in time.

(3.) Sensation, or the sensation-element, is known still further: First, *physiologically*, as dependent on the excitement of the sensorium, in whole or in part, by some physical excitant or object. The sensorium is a collective term for the nervous organism and the sense-organs conjoined. This organism, animated by the sentient soul, acts as the agent or instrument of the several sensations. How it is fitted thus to act, we do not know. What there is in its nature which renders it capable of responding, as it does, to the impressions or excitements which it suffers, we cannot explain. We know that each class or portion of the sentient nerves is capable of a special sensation, and so far is idiopathic. In order to produce it, the excitement or impression must usually be applied to the nerve-endings, in the sense-organs. A class of exceptions to this rule is found in the effect upon the nervous filaments of electric and chemical action, of pressure, of certain morbid and abnormal bodily conditions occasioning what are called the subjective sensations of light and sound, and perhaps of taste.

(4.) Second, *psychologically* considered, sensation is a more or less positively pleasant or painful experience of the soul, as *consciously animating and acting with an extended sensorium*. The sensations are in this respect sharply distinguished by the soul itself from the desires which attend them, as well as from the purely spiritual emotions. When the soul is said to be conscious of its sensations, consciousness cannot be used in the technical sense of a direct cognizance of purely spiritual acts or states, but of a direct or intuitive cognizance of this peculiar experience. It follows that the several sensations, inasmuch as they are experienced by the soul in its connection with the extended sensorium, must be indefinitely but really separated from each other by distance and place.

(5.) Perception, as an act of the mind, is *subjective* and *objective*; as *subjective*, it is distinguished by several steps or processes. As *objective*, it apprehends some being. The result is a *product*, or the *object as known*.

Subjectively viewed, sense-perception is distinguished as *original* and *acquired*, or *simple* and *complex*, and as *direct* and *reflex*. In original or simple perception, the mind knows the

single percepts which are appropriate to single organs of sense. In acquired or complex perception, it connects these with one another under a variety of relations. In direct perception, the relations used are those of extension and diversity; in indirect, those of likeness, causation, and design are also employed.

Objectively viewed, perception always knows a material non-ego. But the objects of simple and complex perception are unlike.

(6.) In *simple* or *original* perception, the *object* is a *simple percept*—i. e., an extended non-ego. But the term *non-ego* is equivocal, being capable of three distinct meanings, corresponding to the three distinguishable *egos* with which they are contrasted. These are the following.

(1.) The perceiving agent as a pure spirit; (2.) the percipient agent as a spirit animating an extended sensorium; (3.) the individual as spirit, sensorium, and body. The three non-egos contrasted with these are: (1.) The sensorium in excited action, distinguished by the soul from itself as a pure spirit; (2.) the body perceived as other than the sentient soul—i. e., the soul as animating the sensorium; and (3.) the material universe as distinguished from the soul, sensorium, and body—i. e., from the man as soul and body united.

(7.) In original perception, the *object* directly apprehended is the sensorium as excited to some definite action. This is distinguished from the soul as percipient, by the soul's own act of discrimination. In other words, the *ego* and non-ego contrasted are the first named above. This non-ego is the *percept* appropriate to each of the sense organs.

Some contend that there are but two organs and two forms of direct perception—those of touch and sight; the senses of smell, taste, and hearing, giving sensations only.

(8.) *Indirect* or *acquired* perception first combines single percepts into material wholes or objects, by referring them to the same portion of space. The first experiment is made with the body itself, the perception of which the soul completes, knowing it within and without. This gives the non-ego in the *second sense*. Other percepts it proceeds to combine and construct into other bodies, by processes of comparison, measurement, and induction, after the analogon of the body which the soul inhabits. These are distinguished from the body itself, giving the non-ego in the *third sense*, the distances, forms, sizes, etc., being assigned by the various processes of judgment, which are usually called acts of acquired perception.

(9.) Later still, the intellect knows the percepts thus united as *substance* and *attribute*, when it connects the objects with the sensations which they excite under the relation of causality, or compares one object with another under the relations of form and dimension. To do the one, the material object must be compared with the sentient soul, by an act of reflexive analysis, both being projected into the mind's field of view. To do the other, motion, measurement, and analysis are required to separate length, breadth, size, and form, from the things to which they pertain. Recognition, generalization, and other acts of the higher intelligence greatly stimulate and aid this activity, but are not essential to it. Many, not to say all, of these acts of acquired or indirect perception are acts of natural and unconscious induction, which, like other such acts, must assume in the objects known adaptation to the mind that knows them; in other words, must assume design and order in the universe.

When the material object is known in these elements and relations as a product familiar to the mind, the process of sense-perception is complete.

(10.) When, moreover, consciousness is so matured as to distinguish the soul's spiritual acts and emotions from its sensations and their objects, then the non-ego is distinguished from the *ego* in the *first sense* required, and all the relations of matter to the spirit, which are objects of common observation, are attained and made familiar to the intellect.

(11.) In the process of sense perception the state of the intellect is *active*, and *active* only. It is a form of that knowledge, by which beings and relations are cognized as real. This activity is intimately allied to the higher processes of which it is the essential condition, and like them is directed by the emotions and the will, which together with the intellect make up the endowments of the conscious soul.

CHAPTER IX.

THEORIES OF SENSE-PERCEPTION.

THE summary and review with which the preceding chapter concludes, presents in brief the theory of sense-perception which is taught in this volume. It seems desirable, in connection with it, to give a brief historical survey of the several theories which have been held by others. Such a sketch will prepare the student to understand the difficulties of the subject, as well as to appreciate the successive advances which have been made toward an explanation of the very difficult problem which these theories have undertaken to solve. It may also be useful in preventing the reader from too readily accepting the materialistic and physiological solutions which are urged so confidently as being the latest and the most satisfactory. The history of the earlier speculations serves to show that these solutions are neither so recent nor so rational as their advocates contend.

§ 194. All philosophers have undertaken to give some theory or explanation of the perceptions of sense. These perceptions are among the most striking and interesting of all phenomena, and would naturally attract the attention of all inquisitive minds. They vary in uniformity with the changing condition of the bodily organs, and of the objects and media with which these organs are concerned. For this reason, men of philosophic tastes would be prompted to devise some theory to explain how and why these perceptions so often change.

It is not strange that these explanations have always been derived from the generally received opinions or philosophical theories concerning the forces and laws of nature, and the powers and laws of the human soul. As the sciences of nature and of the soul have been continually changing, one theory of sense-perception has given place to another. False or defective theories of nature and the soul have, by a necessary consequence, involved false or insufficient explanations of the processes of sense-perception.

On the other hand, erroneous theories of sense-perception have, by a reflex influence, affected to a very large extent the philosophy of the soul. It is natural that it should be so. The acts and instruments of sense-perception are the first to attract attention, and to challenge and receive some sort of explanation. The explanation given to these processes would naturally be extended to the other and higher activities. The conditions and laws of sense-perception would readily be taken as the types of all the intellectual processes. Whatever theory were adopted in respect to the nature of sight and hearing, would be extended to memory and the imagination. It is not surprising, therefore, that these theories have occupied so large a place and exerted so powerful an influence in the history of psychology and of speculative philosophy.

Theories of sense-perception are especially liable to be erroneous, from the circumstance that they involve so many elements. The processes are themselves most complicated, involving, as they do, corporeal and psychical agencies. The corporeal element is in part material, and requires a correct knowledge of matter, and the distinction between that which is organized and living, and that which is inorganic and dead. In order fully to understand the processes of sense-perception, we must know their conditions or media; this involves a correct, if not a complete, knowledge of such agents as light and sound. A grossly erroneous theory of either might vitiate our theory of the psychological processes of sight and hearing. The scientific knowledge of these

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agents and their laws includes assumptions both mathematical and metaphysical, which may be correct and complete, or erroneous and defective.

The instruments of sense-perception are the bodily organs; and to understand these organs we must not only have a correct theory of the living organism, but also of its relations to the rational soul. The psychical element in perception is also complex. The consideration of perception as a special act or kind of knowledge, requires some just views of knowledge in general. A serious error in respect to this fundamental point would, by a logical necessity, involve mistake or defect in respect to every form of knowledge. The element of *feeling* is also present in sense-perception in what is called bodily sensibility, the correct theory of which involves just views of the nature of feeling in general, and of the relation of feeling to knowledge. Any theory concerning a process which involves so many elements is necessarily exposed to error. That which we should expect would be true, we find made real in fact. In the various theories of sense-perception which are so prominent in the history of philosophy, the errors and defects are to be traced to some false assumption or oversight in physics, physiology, or metaphysics, or in all these sciences combined.

Theories of sense-perception are, to a great extent, theories of vision. This is not surprising. The phenomena of vision are the most prominent in our experience, and the most attractive to our attention. The organs of vision

are more complicated than those of any other sense, and at the same time more easily separated into their component parts. The necessity and the functions of some of these parts are obvious to the most casual observer. Every question which can be asked in respect to any of the perceptions, presents itself in connection with the phenomena of vision; so that a correct theory of vision would necessarily be a correct theory of sense-perception in general. As might be expected, the theories of sense-perception which are recorded in the history of philosophy, are, for the most part, theories of vision, and the illustrations and examples of the power of sense-perception, its actings and its laws, are almost universally drawn from the power of seeing with the eye.

The early Greek philosophers.

§ 195. We begin with the theories of the earlier Greek philosophers. In these there is very little to interest or instruct us, except as they serve to illustrate the causes of error, and to show us the beginnings and germs of almost every one of the false theories which deform and mislead modern speculation. These are all alike, in not sharply distinguishing the soul from the body, and scarcely from inorganic matter, in respect either of essence or functions. The first effort of philosophy was to resolve all phenomena—beginning with those most obviously material and mechanical, and terminating with the most spiritual and free—into some single element, as original and all-pervading. Whether all spirit was in effect resolved into matter (as by *Democritus* and the Atomists), or all matter was sublimated into spirit as it seemed to be by *Diogenes* of Apollonia, the elements of each were the same in essence, and the differences in operation and phenomena were matters of combination and degree.

Diogenes of Apollonia.

One of the best examples of the current modes of explaining the phenomena of sense-perception is furnished in the theory of *Diogenes* of Apollonia. The soul, according to him, is a more highly refined, drier, and warmer air or vapor, differing from other agents and beings in this only, that its element is purer than theirs. Sensation and sense-perception occur when outward objects set in motion the organs of sense, and, through them, the air which, as the soul, pervades every part of the body. This explanation, in principle, does not differ from that of those modern psychologists who resolve sense-perception into vibrations of material agents without, which excite finer and quicker vibrations in the nervous organism, the character of the sensation being conceived to depend on the frequency and rapidity of these vibrations. (Of *Locke*, *L. George*, *J. D. Morell*, *A. Bain*, etc.)

Heraclitus and Empedocles.

Heraclitus accounts for sensuous knowledge by making the inner fire of the soul to unite with, or, in modern language, to respond to the outer fire of the universe. This explanation is but a consistent application of the general assumption that fire is the original element in all forms of being. *Heraclitus* was more conspicuous as a metaphysical philosopher than as a psychologist.

Empedocles of Agriguntum is worthy of notice, for two or three reasons. He was the first, according to *Ritter*, who introduced the distinction between sensuous and divine knowledge—who taught that the impressions of sense must be corrected by the notions of reason. It was an axiom with him in explaining

sensuous knowledge, that like can only be known by its like. This assumption pervades the great majority of the theories of perception down to the present moment; and, as we have seen, it is with the greatest difficulty that the mind can rid itself of its influence. (Cf. Hamilton, *Works of Reid*, p. 300, note.) In conformity with this view, he seeks to show that sense-perception can only be explained by our knowledge of the composition of the body perceived, and of the forces which act upon it. The objects of sense send off certain effluvia, *ἀερίδια*, from their surface, which pass into the human body through pores (provided in the several organs). The blood in the vicinity of the heart constitutes the human intellect; and in whatever part of the body this blood is properly mixed and refined, there is superior skill and dexterity, as in the hand of the mechanic, and in the tongue of the orator.

Vision is explained by Empedocles (cf. Aristotle, *De Sensu*), in his poem on the *Nature of Things*, by the doctrine that the eye is composed of fire, the noblest of the four elements—if, indeed, Empedocles did not hold that fire was the master-element. Fire produces vision by radiating from the eye, as light is emitted from a lantern. The reason that this fire is not extinguished, is that it is defended by the watery coats of the eye, which act like the sides or walls of the lantern.

Democritus was the first conscious and avowed materialist, resolving, as he did, all the different kinds of being, with their phenomena, into combinations of atoms, differing in size and shape. He taught that the soul differs from the body, by being composed of finer particles, constituting, as it were, a finer body inclosed by the grosser and the corporeal. All sense-perceptions are occasioned by contact. In modern phrase, all the senses are resolved into the sense of touch. That which is brought in contact with the soul is not, however, the material object; but its *εἰδωλον*, or image, being detached from its surface, reaches the soul by passing through the pores of the organ of sense. The *εἰδωλον* and the *ἀερίδιον* were nearly the same, unless the *ἀερίδιον* was used to emphasise the material element, and the *εἰδωλον* that which is subjective and spiritual. The nature and signification of either do not seem to have been held with greater intelligence and precision in earlier times than the corresponding terms [as image, representation, species] and conceptions are employed and understood in modern philosophy. At one time they were used in a signification simply and grossly material; at another, as the product of the combined activity of the spiritual and material. (Cf. Ritter, vol. i. B. vi. c. ii. note.)

From Democritus, Epicurus borrowed the notion of *effluvia*, *simulacra rerum*, which he conceived in the grossest form—viz., that they “are like pellicles flying off from objects; and that these material likenesses, diffusing themselves everywhere” in the air, are propagated to the perceptive organs. In the words of Lucretius: “*Quæ, quasi membrana, summo de corpore rerum dereptis volitant vitro citroque per auras.*”

It does not follow, however, because the surface, or its *εἰδωλον*, must always be touched in sense-perception, that its form and size, or the form and size of its particles (in modern phrase, space-attributes or relations), are what are perceived. What is perceived through the contact of an *εἰδωλον*, of certain particles, are not these atoms, or their space-relations, but a semblance or subjective result which they give; e. g., the white which we see in its *εἰδωλον* is simply a smooth surface, and the black is a rough surface. Yet these surfaces, as seen by us, are seen as white and black.

§ 196. The philosophers of the Socratic school (Plato and Aristotle) recognised the doctrines of their predecessors to some extent, either to expand or refute them. They made important additions to the philosophy of previous times in respect to the theory of sense-perception, as well as to the doctrines of general philosophy. The doctrines of Aristotle and Plato, and even the terms which they employed, can be traced among philosophers of every age since their time; and they still reappear and exert their influence among the most recent schools. Aristotle especially gave the law to the schoolmen, from whose teachings the modern theories have retained many traditions. Plato is still appealed to and quoted by his admirers for his eloquent and just psychological discriminations, even in respect to the theory of sense-perception.

Plato taught very distinctly and emphatically, especially in his *Theætetus*, that sensation (proper) is an effect jointly produced by the force, motion, or action (*φύσις*) of the material object and the sentient agent, and that it varies, of course, with this joint activity; that the sensations of no two sentient beings need necessarily be the same, under the same material conditions at the same time; and that the sensations of the same being, from the same object at different times, need not be the same, but may vary very greatly. Sense-knowledge, *αἰσθησις*, is therefore untrustworthy, illusive, and, it may be, deceptive. With this he contrasts the higher kind of knowledge, *ἐπιστήμη*, viz., that which is rational and intellectual—the knowledge of ideas, or of objects in their ideas. This knowledge, in its subjective character, is certain and satisfactory; in its objects it is permanent and fixed. These views were not matured by Plato into a detailed scientific theory, nor have the Platonists ever succeeded in thus perfecting them. The great deficiency of these theories has been, that they have omitted to explain how this changing and in part subjective material [the sensation proper] is related to that which is fixed and trustworthy [the perception proper]. They have therefore served rather to excite inquiries, than to meet and answer them.

In the *Timæus*, Plato uses the simile, if he does not adopt the theory of Empedocles, and explains the process of vision by the excitement of the fiery nature of the eye by the fiery nature of visible objects.

Whether he intended this as a gravely-held physical or physico-physiological doctrine, or as a mythical or symbolical assertion, it may not be easy to decide.

Aristotle urges against this doctrine of Plato and Empedocles, that vision cannot be produced by the radiation of light from the eye; that, if it were true, we could see in the darkness, without the aid or instrumentality of the light. Against the view that it is caused by influences or emanations that stream forth from visible objects, he insists that such an agency would require an appreciable period of time for effective action.

Against the assumption that had been accepted in many of the theories that were propounded before his time, he urges that there are but four elements, while there are five senses; and it cannot therefore be true that each sense-organ consists of a single element. He does not, however, wholly reject the doctrine of Empedocles, that like can only be perceived by its like; for he concedes that each one of the senses is, in its elementary constitution, akin to the element which it perceives—water being the chief element in vision, the air in hearing, the sun or fire in smell, the earth in touch and in taste. In critically examining the theories which had been held before him, and setting aside much in them that was untenable, Aristotle rendered a very important service to the psychology of the senses.

We find in Aristotle also the beginnings of the attempt to consider apart and to distinguish the intellectual act of perceiving on the one hand, and the physical conditions or media by which objects are actually perceived.

In respect to vision, he made a great advance upon his predecessors, in teaching that visible objects do not act directly upon the eye of the percipient, but through a transparent agent or medium. When this medium is in action, there is light; when it is inert or at rest, there is darkness. When mixed with opaque substances, as in material objects, there is color. In the eye, this medium must be present as the condition of vision; because the light, being the active condition or state of the medium, can occur in no place where the medium is not present. Vision cannot be a result of fire within united to fire without, but a result of the excited medium without, which is propagated to the medium within. This medium, which conditions the light, exists more commonly in the form of water, and also in the form of air. How nearly the doctrine of Aristotle approximates to the modern theory, that light depends on the undulations of an invisible ether, will be readily recognized.

Aristotle taught, also, a doctrine of the refraction of light. Of this refraction the transparent medium spoken of is susceptible when it appears as water and air. Refraction weakens the light, and color results. This refraction occurs within the substance of the eye as really as elsewhere; but Aristotle ascribed no agency to this refraction in the production of the images of external objects. There is no evidence that he knew of the image upon the retina.

Indeed, in respect to the construction of the eye, he made little advance upon his predecessors, and knew little or nothing of the discoveries made by modern anatomy and physiology. The only observation which he records is scarcely worth noticing. It was, that the eye can produce light within itself—*i.e.*, be the recipient or product of subjective sensations (*De Insomn.* c. 3, 5). This phenomenon he accounts for by asserting that the eye can divide itself into two parts, one of which is the producer, and the other the recipient of the light.

The other senses require a medium as truly as does vision. The medium is in every case set in motion or brought into action by the perceived object, and is thus made capable of acting upon the appropriate sense. It would seem, at first, that in the case of touch no medium is required, but the percipient is itself the body or flesh. More careful observation shows that, as the perception [sensation] varies with the changing condition of the flesh, the flesh must, as the medium, be distinguishable from the percipient, notwithstanding that they coincide in occupying the same space.

In respect to the construction and offices of the remaining organs of sense, Aristotle taught little that is worth reciting. The ear is the organ of sound, because it encloses air, which is immovable unless it be agitated by excitement from without. The organs of both touch and taste are in the region of the heart; and as smell is nearly allied to taste, the same is true of this sense.

All perceivable objects are extended, but their essence, as perceivable, does not consist in their being extended, but in a certain relation or proportion which they bear to the percipient. The extended object has the power to act in a particular way, and the percipient, in like manner, the capacity to be acted upon; the joint product or result of their coaction is the perception. This product varies indefinitely, according as each related term varies—*i.e.*, as is the relation of the one term to the other. But the direct and proper object of the perception is not the extended object as such, but the sensation which results from the joint action spoken of.

Objects, to be perceived, must have a proper size, neither too small nor too great.

In respect to the intellectual element in sense-perception, the element which we have called the discernment, or the discrimination, of relations, Aristotle is not clear and explicit. Now, he asserts that in perception, neither truth nor error are possible, but that these can only pertain to the higher powers of the soul. Again, he calls the power a judging faculty. The phenomena and products of sense-perception, he shows most clearly, have an element which does not pertain to the purely and properly intellectual powers; but he does not explain the element which both have in common. In this he gave the example for the confusion

The intellectual element.

and defect of clearness which have prevailed from that day to the present. On the other hand, he asserts most clearly, and gives great prominence to the fact, that the objects of sense are individual, while those of the intelligence proper are general. This distinction is of the greatest importance. In seeming, however, to limit the functions of the intellect to the apprehension of general objects only, he apparently left no place for the action of the intelligence in perceiving objects of sense.

The common or sensory percipient. Aristotle held that there is a common percipient or sensory, by which the several sensations are measured, judged, and united together. Each separate sense apprehends its own object, as the eye color, and the ear sound; and each apprehends or discerns its object correctly. That which is common to all objects are these five: motion, rest, number, size, and form. The seat of this common sensory or common percipient, is

the heart. This power combines and separates the percepts appropriate to the several senses, and prepares them, so to speak, for the phantasy and the memory, both of which are activities of the common percipient. The rational soul, the *Noûs*, apprehends the general and the permanent. As contrasted with this *Noûs*, & c., the higher or the rational being, that which is properly the active energy, all the lower and antecedent powers are collectively called the passive or the affective. In many of these distinctions Aristotle fixed the divisions and definitions not only for the schoolmen, but for modern psychology.

Matter and form, or species. The doctrine that objects are not themselves perceived, but their species or perceptible forms, was initiated by Aristotle (*De An.*, B. ii. c. 12). As the wax receives only the impression or image from the device on a seal-ring, and not its matter, it making no difference whether the ring is gold or iron, so is the perception by each of the senses.

What is received, is not the matter of the object perceived, but that which it effects in conjunction with or in relation to the percipient. This is its form—*τὸ εἶδος*, species. What was intended by this form, was variously interpreted by the Greek commentators, Simplicius and Themistius contending that the percipient is the bodily organ, which received a corporeal impression; and Alexander Aphrodisiensis and John Philoponus that it was a mental power, which, by perceiving, gained a mental impression or form. The last were doubtless in the right. (Cf. Hamilton's very valuable Notes, *Works of Reid*, pp. 327, 381; *Metaphysics*, Lec. xxi. vol. ii. pp. 36, 37, 38; Am. ed., pp. 293, 293.)

The distinction between *matter* and *form* or *species*, was transmitted, through the successors of Aristotle, to the schools of the Middle Ages, and became an hereditary and perpetual text for controversies and discussions, not only in respect to the nature and validity of the sense-perceptions, but of the objects and processes of our higher knowledge. These controversies have not yet terminated, nor have the terms over which they have been fought been laid aside. *Matter* and *form* are as fresh and living as ever in some of the modern schools.

§ 197. The most of the *schoolmen* retained in substance the distinctions and the doctrines of Aristotle, making such advances upon them as were to be expected from active disputants and well-trained dialecticians, who employed their energies almost exclusively in defining more precisely what they supposed their great master intended, or in deriving new inferences from the materials and data which he furnished. They discovered no new facts hitherto unobserved, and made no new definitions or discriminations either on the physiological or the psychological sides of sense-perception.

The schoolmen were not exclusively the followers of Aristotle. They were influenced more or less by the doctrines and the terminology of Plato.

In respect to the medium of perception, they held, in general, with Aristotle, that such a medium is required for every act of perception, both when the object is in immediate contact with the organ of sense, and when it is not, but seems to be in contact with it.

In respect to the organ of sense-perception, their views did not differ materially from his. They had a better knowledge of the parts of the eye, but no acquaintance with the image formed upon the retina, nor of the facts or laws of refraction and reflection. Of the constitution of the other organs they knew still less.

Their doctrine of species. The doctrine of the necessity and agency of species in sense-perception was prominent in the theory of the schoolmen, and their views may be summed up in the following propositions: Objects are not and cannot be directly and immediately perceived, but only their *species*. The reasons given were the following: The object often is plainly not in contact with the sentient organ. It is also in its nature unlike the sensitive soul, and therefore cannot affect it. Every thing known must be in the knowing agent; but it is impossible that this should be true of the object. It can only be true of its species. Experience, moreover, proves that the image or species only is perceived. When a stick is thrust into the water, it is seen to be bent or broken. A change in the medium changes the object perceived. Our perceptions of the same object vary at different times.

But the species is not a material entity or efflux. At least, it was not so regarded by the more profound and intelligent. It was scarcely possible, however, that it should not be treated as a material entity, and so have prepared the way for the grosser doctrines of the intermediate representative image. The species is not perceived, but only the object through or by means of the species. And yet the species so far forth represents the object, that when it acts upon the organs of sense, it moves or excites the

perceptible to discern, by its means, the object itself. Some of the schoolmen taught that these species had some spatial relations—that they existed in every part of space, bridging over, by a continuous series, the interval between, or binding together the object and the sentient.

The species directly produced was called *species intentionalis*, or intentional species. Of these there were as many of any single material object as there are separate sense-organs, each species being appropriate to and dependent upon the joint action of the organ and the object. They were called *intentional*, because by means of them the mind tends or reaches directly toward or to its object. "*Appellatur autem intentionalis quia per ipsam sensus tendit in objectum.*" Fr. Eustachii *Summa Phil. quadripartita*. "*Ac per medium trajicientes intendunt, ex quo etiam vulgo intentionales oppelluntur.*" Gassendi, *De Sensu*, p. 357, ed. 1658. "*Ut proinde intelligamus tum suo fungi munere sensum, cum agit, seu intenditur in rem objectam eamque cognoscit.*" Gassendi, *De Sensu*, 329. As the *intentional* species were present to the first or direct perceptions, a second species, the *species sensata*, or species of the second intention, were present to the common sense, the fancy, and memory, each of which had its species, and all of which prepared the rational intellect to construct the *species intelligibiles*, which are the last attainment of the higher intellect, and are alone the objects of our higher and valid knowledge. A difference was made between the *species impressæ* and the *species expressæ*. The *species impressæ* were material and sensible, so called because they were impressed by objects upon the external senses. They become intelligible by the elaboration of the active intellect, and are thus prepared to be received by the passive intellect. They are called *expressæ* because they are expressed from the impressed species, and it is by the *species expressæ* that the passive intellect knows external objects (cf. Malebranche, *Search after Truth*, B. iii. part 2, chap. 2).

A few among the schoolmen rejected the doctrine of sensible and of intelligible species. Among the most conspicuous was William of Ockham, who was led, by the boldness with which he urged the doctrines of the Nominalists, to reject also the doctrine of sensible species. His doctrine was expressed in the following thesis: "*In sensu exteriori, sive accipitur pro organo, sive pro potentia, non imprimuntur aliquæ species necessaria prævis primæ sensationi.*" (Of. Hauréau, *De la Phil. Scholastique*; Rousselot, *Études sur la Philosophie dans le moyen âge*; *Summa Philosophiæ quadripartita* a Fr. Eustachio à Sancti Paulo; H. Ritter, *Geschichte der christl. Philosophie*.)

§ 198. From the schoolmen to the moderns, Gassendi represents the transition period. He dared to question and to break from the authority of Aristotle, and the opinions received by tradition from him. On many points in psychology he follows Epicurus, but not so far as to deny the spiritual nature or the essential immortality of the soul. In respect of sense-perception, he taught the scholastic theory, except that he rejected the doctrine of species in all its forms, after a careful discussion.

§ 199. It was Descartes, however, who made a permanent inroad upon the philosophy of the scholastics, and introduced the modern science of psychology. He prepared the way for the distinctions and discussions in respect to sense-perception which have played so important a part in modern speculation. The doctrines of Descartes which we need to notice are the following:

1. Descartes drew a sharply-defined line between spirit and matter in respect to both essence and phenomena, and of course distinguished clearly between the soul and the body.

Previous to his time, the soul was regarded as the crown and consummation of the body. Those who held to the spirituality and immortality of the spiritual being, asserted a separate and separable nature only for the voice, or the higher soul. Many had taught that this higher nature was a distinct substance from the lower; that the rational soul was a distinct being from the vegetative, sensitive, and fantastical, all of which were supposed to be so far functions of or dependent on the body, as to perish with it.

Descartes, on the other hand, was the first to teach that spirit, in all its modes of being, is distinct from matter, and is proved to be such by its peculiar and distinctive phenomena. The essence of matter is extension; the essence of spirit is thought. He asserted that we have a clearer and more certain knowledge of the existence of spirit than of that of matter. Of the first, we are directly conscious. We cannot doubt that we think, for, in the very act of doubting, we think. Concerning matter, it is possible to suppose that there is no reality corresponding to our ideas (cf. *Meditationes*, etc.).

This doctrine of Descartes opened the way for an entire separation between matter and spirit, and, in consequence, for doubt or uncertainty in respect to the validity or trustworthiness of sense-perception. It allows us to raise the question, or rather it forces us to ask, How can we be certain that our sense-perceptions deserve to be trusted at all? how can we discriminate between those which are trustworthy and those which are not?

2. All the affections of the body, being phenomena of matter (of which the essence is extension), can only be resolved into positions and motions of its parts in space. Hence all those changes in the organs of sense by which we perceive must be changes in the relative positions of their parts. Such changes are wrought by the action of the external object on the organ, and are taken by the spirit as the signs or indications of attributes of external objects. Whatever these attributes are, whether sounds, smells, tastes, touches, or sights, they are only known to the spirit by the changes which they effect in the parts of the organ of sense. They are knowable and are known by the motions and positions which are conveyed from these organs to the brain.

2. The medium by which they are conveyed was held to be the *animal spirits*. These were a highly subtle fluid, invisible to the eyes and imperceptible by any of the senses, which were supposed to be secreted from the blood, either by the glands, the liver, the heart, or the brain, and to be so mobile and expansible as readily to fill all the vessels and passages of the body. By the animal spirits the body is nourished, the life is maintained, motion is imparted, and sense-perception is performed. They serve as the instrument of sensation, by producing in the brain [conveying] changes corresponding to those occasioned by the organs of sense by the action of the object perceived. When these changes are thus conveyed or produced, the body has done all its work preparatory to the sense-perceptions of the soul. This work of preparation being done, the soul perceives.

But the soul does not, by a second or internal sense-perception, apprehend the last of these series of mechanical changes wrought in the brain, as though the soul were endowed with another interior apparatus of sense. How it becomes aware of these changes in the brain is not explained by Descartes; nor how, when these changes are made known to it, they serve as indications or signs of qualities in material objects. Descartes never asserted, as did some of his disciples, that these changes served as representative ideas—that in vision, the image on the retina, or its results on the brain, served as a copy or reflected picture, which was compared with the object itself. On the other hand, he held to the doctrine of a representative idea, in the sense that, on occasion of the apprehension of these changes, the mind had sense-perceptions of objects. As the schoolmen held that by or through the several species, the soul perceived objects, so he held that through or on occasion of these mechanical changes, excited and propagated through the corporeal machine, the soul apprehended the objects of which these were the indications or signs. John Baptist Porta first discovered, in 1583, that the eyeball is a camera obscura, but he thought the lens received the image. Kepler corrected the error, in 1604, by showing that the retina formed the image. Scheiner, in 1652, was the first to take the coat from the back part of the eyeball of several animals, and to show sharply-drawn images actually depicted on the retina. Descartes was born 1596, and died 1650.

It ought never to be forgotten, that the body is regarded by Descartes simply as acting like a machine in all its functions, even those of sense and motion. Indeed, he calls it a perfectly contrived machine, and insists that all its most subtle processes, even those most withdrawn from the possibility of direct inspection, might be fully explained by a finer arrangement of mechanical powers. In entire consistency with this view, he contends that animals are nothing more nor better than machines, and are incapable of any psychical experiences or processes. As soon, however, as the rational soul, whose essence is thought, is united with the body or the man-machine (*homo machina*), it uses its mechanical adjustments as instruments of sense and motion. It connects one sensation with another, by means of the contemporaneous occurrence of the bodily motions appropriate to each. When a part of the body is bruised or burned, it learns to apply the requisite motions, beginning in the brain, and reaching in a series to the parts affected, which ensure its withdrawal from the offending cause. By the arrangement and extent of these brain changes do we judge of the size, distance, position, and other attributes of external objects of which they are the indications. We see one object with two eyes, just as we touch one object with two sticks; the apprehended motions in the brain, (serving a similar office to the double muscular sensations with which we hold the two sticks), make the two sticks feel one object. But it is not explained how the soul is capable of knowing the last movements of the machine, or how it reads the index in the brain. It is true, Descartes supposed the seat of the soul to be a small gland in the midst of a small cavity at the centre of the brain. To the plexus of tubes and interstices which constitute the walls of this cavity, the animal spirits bring the last changes which correspond to each sense-perception of material objects, and by the changes effected in these walls they carry the orders of the soul. "*Hanc glandulam esse sedem animus primarium atque organum imaginationis sensusque communis.*" Renati Cartesii *Tract. de Hom.* But though the cavity is represented as "a presence-chamber"—and it would seem as though the soul, from its central seat of observation, must gaze upon the reports or images that are pictured so rapidly upon its walls—yet this is not the doctrine of Descartes. True to his principles concerning the nature of spirit, he asserts that, as it occupies no space, and its modes have no relation whatever to the modes of extended matter, the connection between the two is the result of the simple appointment of the Creator. All that we know is, that with these motions of the bodily machine the perceptions and movements of the spirit are connected.

4. All sensations are purely spiritual affections, being, in his language, "modes of thinking," or of thought, which, in its nature, has no relation whatever to extension. The sensation of pain which we refer to the foot, is simply in the mind; the sensation of color which we refer to an external object, is in the mind only; it is neither in the eye nor in the picture to which we ascribe it.

That we refer these sensations to such objects, or locate them in any part of the body, is the result of the habit of confused thinking which we contract in early life, and of the prejudices and associations which arise at that period. But when we resolve our knowledge into clear and distinct ideas, we find these opinions to be false, and that our sensations properly belong to the mind alone.

5. The soul, in its sensations, is purely and simply passive; even in its inclinations and desires, which are functions of the will, it is passive.

6. The diversity in the qualities of the sensations is owing to the diverse motions of the body which

occasion them. They are painful, when the fibres of the muscles and other organs are irregularly moved and strained. Pleasure attends their easy and harmonious action. These are stated as general facts, which are derived as inferences from assumed principles. Why one kind of motion or action should give pain, and another pleasure, is not explained.

7. Besides the inherent capacity of the soul to know its own affections, and its superadded power of becoming apprised of the affections of matter through the motions of the body, Descartes taught that the soul is also furnished with innate knowledge or beliefs: such as the belief that God exists, and is all-perfect; that every quality belongs to a substance, and every event is produced by a cause. The criterion of truth and falsehood was thus assumed: Clear ideas we know to be true: Ideas that are confused, are false. By the application of these axioms and this criterion, several problems or questions in respect to sense-perception were readily solved.

8. The perception of extension by the soul is not explained in respect to its subjective process or its objective elements. It seems to have been included by him in the assertion of the soul's divinely-given power to know matter, that it should know its relations to extension. That these ideas are real, is shown by this, that they are the clearest and the most distinct of any.

9. Material objects are known as external to the soul by the following process: The soul finds itself affected with certain sensations, or modes of thought. They are known not to be caused by the soul's own agency. Under the axiom that they must be referred to a cause, the mind believes in the existence of material objects as the external causes of its own sensations.

It would seem, however, that this process would only give negative knowledge to the mind, or the belief that there are existences which are not spiritual. We must suppose that the mind already knows extended being with its relations to space, in order that it may conclude that their non-ego is also extended.

10. We confide in the indications of the senses, because we believe that God is too good a being to allow us to be deceived, or to bring objects before our senses in such a way as to make deception possible. That God is good, we know with innate certainty. Hence we confide in the truth that the ideas of sense correspond to the reality of things. In this confidence we reject the suggestion that all that we seem to perceive is only an unreal show. When we occasionally fall into error, it is because we do not heed the admonitions and correctives which the Deity has provided.

These are the principal doctrines of Descartes. They contain the germs of the most important truths and the seeds of the most pernicious errors and oversights of modern psychology. As Descartes deserves the praise of having given being and form to this science in its modern phases, he also must bear the reproach of having opened the way for the mistakes and defects which have retarded its rapid growth and hindered its healthy development. There is scarcely a theory of sense-perception in which some erroneous assumption of Descartes may not be traced, and which has not wrought some influence for evil.

Geulincx, a distinguished disciple of the school of Descartes, applied one of his fundamental doctrines as follows: Inasmuch as the essence of matter is extension, and the essence of spirit is thought, it follows that one of these agents can in no way act upon the other, neither matter in imparting sense-perceptions to spirit, nor spirit in giving motion to matter. In every instance in which either sensation or motion occur, the Deity must intervene by direct agency, and produce the effect. Inasmuch, however, as, in the order of actual events, sensation and motion always occur in connection with a material object, or a precedent spiritual impulse, or, in other words, as, in fact, every perception requires some form of extension, and *vice-versa*, each holds to the other the relation of an occasional cause—i. e., each is the constant occasion on which the Deity exerts His active energy.

Leibnitz, at a period somewhat later, reasoned as follows: Matter and spirit cannot act upon each other, it is true; but it is unworthy of God to suppose that He interferes on every occasion in which a mode of one coincides with a mode of the other. Therefore God has arranged from eternity a preestablished harmony, according to which the one never occurs without the other.

Malebranche applied these assumptions in the following manner: Matter and spirit are in no way related. In perception, the spirit does not perceive the material object, but ideas of it. These ideas are not the substantial forms of the schoolmen, nor material effluxes proceeding from matter. In sense is perpetual error. These errors can only be corrected by the higher power of intelligence. This higher power discerns intelligible ideas which are true and trustworthy. These ideas are not originated by the spirit's own creative act. They are not produced by the occasional intervention of the Deity. But they must be seen as they are in the mind of, or in relation to their real essence in, God. The favorite and peculiar doctrine of Malebranche was, that "the soul sees all things in God."

In the support of this doctrine, he not merely used the cardinal assumptions of Descartes, but developed a complete theory of sense-perception with far greater distinctness and detail than any of his predecessors, and did more to give direction and form to the modern theories than even Locke himself. These modern theories owe very much to Malebranche, for making one or two of the most important distinctions, as well as for confirming one or two very serious errors. The distinctions which he introduced are the following:

1. He distinguished, in sense-perception, the element of sensation from the element of judgment. Of the four different elements (*Recherche de la Vérité*, Liv. I. chap. x. § 6; chap. vii. § 4; chap. xiv. § 3), which

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he says occur in almost every sensation, and are confounded by most persons, but which it is most important to distinguish; the third and fourth are the following: the sensation, or subjective state of the soul, as of warmth; and the judgment which the soul makes that this warmth is in the hand or in the fire. "This judgment is natural, or rather, it is only a compound or complex sensation"—"*ce n'est qu'une sensation composée*." This natural judgment is usually followed by another judgment which is true, but which the soul, through the force of habit, makes with the utmost rapidity. In support of the assertion, that into every sensation there enters the element of judgment, he urges the cases of judgment in what are now called the acquired perceptions, as when we judge of the distance and size of a visible object. But it was a great point to have gained, to distinguish the intellectual and sensational element at all.

2. Malebranche comes very near to a proper recognition of the distinction between the conditions of sensation [sense-perception] and the act itself; and among these conditions themselves he makes a distinction. The first two of the four elements already referred to are the action of the object (in the case of warmth) on the fibres of the hand; the second, the resulting motion in the hand, and through the body in the brain. These two elements of the complex state belong to the body; the last two, to the soul.

The errors of Malebranche are the following: 1. While he distinguishes so clearly between the conditions of the sense-perceptions and the sense-perceptions themselves, assigning the one to matter and the other to the soul, he fails entirely in asserting for the soul an inherent power to know the properties and relations of matter; because of the Cartesian assumption that there is and can be no relation between the two.

2. The explanations by which he accounts for the processes of natural judgment, according to which the soul's subjective sensations are referred to the parts of the body, and to objects without the body, are all inadequate and unsatisfactory. The fact only is asserted, that the soul, in its sensations, also judges; but by what methods or upon what criteria or grounds, is not explained. The natural judgments (and acquired) of sense are treated as having no relation to the judgments of pure intelligence. The first are treated as always confused, illusive, and untrustworthy. The last only are regarded as true, by virtue of the relation of their objects to God.

3. Malebranche accepts the doctrine, that it is only through ideas that we can apprehend material objects, and thereby denies that we can know such objects as they are. He gives various reasons to show that these intermediate ideas are necessary. They are mostly drawn from the phenomena of vision. While he rejects the doctrine of species and effluxes, and every form of material representation, he as earnestly supports the doctrine of immaterial representatives, and holds that these are changing, uncertain, deceitful, and confused, when contrasted with the pure ideas which are attained in God.

It deserves here to be noticed, that Malebranche was entirely rigorous in the application of the Cartesian theory of the nature of matter to the conception of what is really knowable of material things. If matter is extension only, then all the knowledge of matter which we could possibly gain by sense-perception would be of certain relations of extension. Even our knowledge of the sensible qualities, as of hot, cold, yellow, blue, rough, and smooth, would be the knowledge of the positions and changes of the material particles [*i. e.*, portions of extension] on which they depend. Of these relations of extension sense gives us imperfect and inconsistent knowledge; as when we look at a cube, each side is equally square in its real form and relations, but they are not so in their rational idea.

4. Malebranche asserts, that in sense-perception the soul is passive in all its elements. It is true he asserts the same of the whole intellective nature, making the activity of the soul to belong only to the emotional powers; but the error was none the less serious in respect to his theory of sense-knowledge.

§ 200. *Antony Arnauld*, who was the most distinguished opponent of Malebranche, contributed greatly to the correct theory of sense-perception. He maintained the following positions against Malebranche:

1. It is a false assumption that the soul cannot perceive except by means of representative ideas. What the soul perceives, is not the idea as distinguishable from and representative of the material object, but it is the object itself. The idea is nothing else than the perception itself. To say that the soul has an idea, is the same as to say that the soul has a perception. The only difference of meaning between the two is, that perception stands especially for the modification of the mind in the act of perceiving; while idea stands for the object perceived, so far as it is in the spirit as an object of thought. "*Ainsi la perception d'un carré marque plus directement mon âme comme appercevant un carré; et l'idée d'un carré marque plus directement le carré, en tant qu'il est objectivement dans mon esprit.*" Chap. v. § 6. *Des vrais et fausses Idées*. The words do not designate two entities, but one modification of the soul which includes two relations. It is only in the sense that the representative ideas differ from perceptions, that Arnauld denies their existence. In the other sense of representative modalities, he holds that all our perceptions are representative ideas. The prevailing error arises from conceiving of these spiritual modifications, by analogies from material images, as representative pictures and drawings. The idea of a material object is the object as conceived by the mind.

2. The soul, to perceive a material object, does not need to come into contact with the object perceived. This, the great argument for an intermediate object, Arnauld confutes at length, showing that it involves the consequence that the idea must have relations to space and to the soul itself, which comes in contact with it. When we perceive the sun, we do not need to go to the sun, nor to its idea.

3. The soul is not passive in perception, but active. It is endowed directly by the Creator with the

Arnauld, A.,
1612-1694.

power to perceive. In the exercise of this power or faculty it is active. It acts in as many ways as it is rendered capable of doing by the creative endowment of God. It is as reasonable to suppose that it can perceive material objects directly, as that it can know directly its own states or modifications.

4. We must, in the last analysis, be able to perceive material objects directly. Otherwise, we should not know that the representative ideas did represent them.

In all these positions Arnauld made important advances toward a correct theory of sense-perception, and prepared the way for, if he did not anticipate, the doctrines of Reid and Hamilton. The fifth chapter of his great work on *True and False Ideas* reminds the reader of the acuteness and subtlety of Hamilton, more than any passage from any other modern writer. It far surpasses any thing in Reid for condensation of language, sharpness of division, and clearness of definition.

§ 201. The speculations of Locke have exerted a powerful influence upon the course of modern philosophy, and incidentally upon the theories of sense-perception. The *Essay on the Human Understanding* is not so much a psychological as it is a metaphysical treatise. It does not so much analyze the powers and functions of the human soul, as it decomposes and traces to their origin the ideas or conceptions which make up the stock of human knowledge. His doctrine of sense-perception is not formally expounded as such, nor is it distinctly propounded in separate propositions. It must be gathered and inferred from his discussions of the ideas of sense, of the primary and secondary qualities of matter, and of the nature and kinds of knowledge.

Locke was familiar with both Gassendi and Descartes, and perhaps with Malebranche, and had in his mind the speculations of these philosophers, as well as the logic current in his time, which retained not a few of the distinctions and phrases of the schoolmen. He was also, as a physician, familiar with the received physiology of his time; and as a physical philosopher he sympathized very warmly with what was called the New Philosophy—i. e., with the doctrines of Boyle, Newton, and the founders of the Royal Society.

From Gassendi he derived some of his materialistic conceptions and modes of explaining mental phenomena, as well as his eclectic tendency to bring together opposite and incongruous principles—e. g., materialistic hypotheses, and theistic and even Christian doctrines. But through the spirit of his own system, he fell far below Gassendi in the analysis of the faculties. Gassendi recognizes reason, or the light of nature, as the source of intuitive truths and of our higher knowledge, and contrasts these higher powers with the lower faculties of sense and phantasy. Locke lumps these powers and their products together, under the general title of *reflection*.

From Descartes he learned to assert, if possible more positively than he, the authority of consciousness, and the validity of the ideas which it furnishes when it is exalted into reflection. But he sets himself most decidedly to deny and refute his doctrine of innate ideas; Locke's first book being a formal refutation of Descartes' *Meditations*. His zeal against this doctrine led him so far that he failed to provide and account for our higher knowledge and intuitions, so that he in this respect even fell far below Gassendi. He rejected the sharp distinction made by Descartes between spirit and matter, going so far as almost to defend the proposition that matter can think. He, of course, set aside the assumption that the essence of matter is extension, and the essence of spirit is thought.

On the other hand, with the Cartesians, he rejected the doctrine of substantial forms, and in entire harmony with the physicists of his time, assumed that all material phenomena, even those which are exhibited by living beings, including those which serve the spiritual soul, are to be accounted for by mechanical laws. Hence, from Descartes he accepted, without hesitation, the doctrine of the primary and secondary qualities of matter.

His aversion to scholastic terminology and over-refined distinctions, and his desire to make himself intelligible to men unused to the techniques of philosophy, induced him to overlook many of the sharp distinctions which Descartes, Malebranche, and Arnauld had made. Their effect was also to introduce confusion of thought and inconsistency of statement into a treatise which both aimed and claimed to be well to the common understanding. The importance of the weighty truths which Locke embodied in this apparently most intelligible treatise, and the high esteem in which Locke has been held by the English people, have perpetuated in Great Britain a similar method of treating philosophical subjects, as well as a loose and confused, yet unscholastic style of writing upon them.

To understand and critically to appreciate Locke, the following works may be recommended: Leibnitz, G. W., *Nouveaux Essais*; Descartes, R., *Meditations: Principia*; Malebranche, N., *Recherche de la Vérité*; Lee, H., *Anti-Skepticism*, Lond., 1702; Butthogg, R., *Essay Upon Reason*, &c., Lond., 1694; *Solid Philosophy Asserted*, by J. S. [Sargent], Lond., 1697; Browne, P., *Procedure, Extent, and Limits of Human Understanding*, Lond., 1729, 2d ed.; *Things Divine and Supernatural conceived by Analogy*, Lond., 1783; Herbert, E., of Cherbury, *De Veritate*, Lond., 1644, 3d ed.; More, H., *Opera Philosophica*, Lond., 1679; Cumberland, R., *De Legibus Naturæ*, Lond., 1673; Cudworth, R., *True Intellectual System of the Universe*, Lond., 1678; Hobbes, T., *Works*, ed. Molesworth, Lond., 1839-45; Smith, John, *Select Discourses*; Cousin, V., *Cours de l'Histoire de la Philosophie*, Leçons 16-26, Paris, 1828-9, 8vo, trans. by C. S. Henry, Hartford, 1884; King, W., *Life of Locke*, Lond., 1830; Taggart, E., *Locke's Writings and Philosophy*, Lond., 1886; Webb, T. E., *Intellectualism of Locke*, Dublin, 1887.

To the theory of Sense-Perception Locke made not a single contribution of what had not been known before, while, by his method of treating the subject, he opened the way for very serious misunderstandings and fundamental errors. This circumstance ought not to diminish our respect for Locke as a man, nor our estimate of the excellence and importance of his Essay.

In respect to sense-perception, Locke's opinions may be divided as follows:

1. Of the *medium* or *physical conditions* of sense-perception he teaches little that is positive, and nothing that was new. He refers to the organs of sense, and also to the nerves and the animal spirits, as receptive of impulses and susceptible of motion, and leaves his readers to infer that it is probably by mechanical changes in their material particles that the conditions of sensation are furnished. He does not explain, however, in detail, what these conditions are, so far as the organs of sense are concerned.

2. Of the *faculty*, he says only that it is a distinct source of knowledge, and that from this we derive all that we know of material qualities—i. e., of the separable elements given by each of the senses. The name of this faculty is usually *sensation* or *external sense*. Its operation or function he usually calls *perception*. He calls it *perception*, B. II. c. ix. § 1. He calls it *sensation*, B. II. c. xix. § 1. Rather, the idea is here called *sensation*. All more precise knowledge of the faculty and its workings we are forced to infer or gather from his view of the objects with which it has to do, and his discussion of the act of knowledge in general. It is, however, a serious defect in his treatment of the faculty, that he uniformly regards it as passive, always representing it as the "receiver of ideas," never as the active agent, which is competent by its own energies to know objects. The process and the nature of perception is rather explained by the objects which are impressed upon it, than by the power of the soul to perceive that they exist.

3. The objects apprehended by the faculty of sense are the *qualities* of matter. Of these there are two classes: the primary and the secondary. The primary are solidity, extension, figure, motion, rest, and number. The secondary are the so-called sensible qualities, as color, taste, smell, etc. These are the capacities in material objects to produce certain impressions or affections of the soul by variations of size, figure, position, and motions of the primary qualities. In the language of the more recent schools, material objects are known by direct or intuitive perception as occupying and related to space, so far as they are known in their real nature. In the same way they are known to be diverse from the mind which perceives them. In their sensible or secondary qualities, they are known as the producers [by means of their essential qualities] of subjective affections of the mind.

These two classes of qualities make up all that we know of material objects, when we add to them the "obscure idea" of *substance*, as that in which they inhere.

4. What *knowledge* is, or what it is for the mind to know, Locke teaches by the following definitions:

"The mind knows not things immediately, but only by the intervention of the ideas it has of them. Our knowledge, therefore, is real only so far as there is a conformity between our ideas and the reality of things" (B. IV. c. iv. § 3). This language seems at first to assert as plainly as possible the view, that it is only by means of intervening ideas that the mind acquires its original knowledge, or perceives material objects and qualities. In support of this construction of his words, Locke speaks of ideas as being conveyed to "the presence-chamber of the mind," as being painted in fading colors, as being consumed to ashes by the fires and heat of passion and desire. Locke, moreover, asserts (B. II. c. viii. § 11, 12) that the way "in which bodies produce ideas in us," is manifestly "by impulse, the only way we can conceive bodies to operate in." Moreover, "if external objects be not present to our minds when they produce ideas in it, . . . 'tis evident that some motion must be then continued by our nerves or animal spirits . . . to the brain or the seat of sensation; and since extension, figure, and motion may be perceived at a distance by the sight," "'tis evident some singly imperceptible bodies must come from them to the eyes, and thereby convey to the brain some motion which produces these ideas." In respect to the secondary qualities, we may conceive that they also are produced by the motion of insensible, i. e., indiscernible particles. For example, let us suppose "that the different motions and figure, bulk and number of such particles" "produce in us the sensations of the color and smell of a violet"—viz., of the blue color and sweet odor of this flower.

Locke, moreover, says of the relation of these "ideas" to their correspondent qualities or objects. "The ideas of primary qualities of bodies are resemblances of them, and their patterns do really exist in the bodies themselves; but the ideas produced in us by their secondary qualities have no resemblance of them at all." He expressly defines knowledge of every kind to be the discernment of an *agreement* or *disagreement* between two entities: in the case of sense-knowledge between the representative idea and its counterpart.

The language of Locke in these passages, if strictly construed, would seem to declare that it is by the intervention of representative ideas that we perceive sensible objects, and that we can only know them so far as we discern that they "resemble" or "agree with" their object. Hence it has been charged upon him that he taught the doctrine of perception by means of intervening images or ideas. It becomes a question of great interest, therefore, what he actually did intend by this careless and confused language. It is obvious that any such theory of knowledge, when applied to sense-perception, would break down by its own weight. It must involve a positive self-contradiction, or else an idle and useless expedient. If we can only know a material object by means of the intervening idea, which "represents" or agrees

with it, then we can never reach or know the object at all; for we may go on by a succession of processes *ad infinitum*, and, when we have done, we shall only have reached a representative idea, but shall never have grasped the object itself. On the other hand, if it be conceded that we can and do perceive material objects, and, in perceiving them, discern that the idea is "conformed to," "agrees with," or "represents" its object, then we must be able to compare the two together—the material object and its idea. But in order to be able to compare the object with its idea, we must know each term which we compare—*i. e.*, we must first have known the object itself. But if we know it already, of what use is it, or how is it possible, to acquire knowledge of it by the idea? It also renders it impossible to know the secondary qualities by any means whatever, for Locke expressly asserts that no similarity exists between the ideas of secondary qualities and the qualities themselves—as of the smell, etc., of the violet, and the qualities in objects which produce them.

These consequences, so fatal to the representative theory, supposing Locke to have held it, would lead us to question whether he intended by "idea," in every or in any case, an intervening representative image; and by the words, "to resemble," "to be conformed to," "to agree with," any relation discerned by a process of comparison. A careful examination of the most of the passages of the *Essay* authorises the conclusion that, however careless he may have been in his language, he never intended to use idea as the condition of sense-perception, so far as by this we acquire knowledge of matter, but only as the mental modification, which we use in mediate knowledge, as in memory, imagination, and generalisation. We have seen (§ 170), that Reid falls into the very same inconsistency of language, and exposes himself, by so doing, to the charge of holding the representative theory. In all cases of what is really representative knowledge, we first have gained the idea by intuition, before we compare it with its object. Locke's definition of knowledge as the discernment of the agreement or disagreement of ideas, would preëminently and only properly apply to logical knowledge, or that knowledge of which "generalized concepts" form the material, and are the terms compared. The language in which he expressly distinguishes between the two kinds of knowledge justifies this interpretation of his meaning. "In the former case [of sensitive knowledge], our knowledge is the consequence of things *producing ideas* in our minds by our senses. In the latter, knowledge is the consequence of the ideas (be they what they will) that are in our minds, producing these general certain propositions." Cf. *Essay*, B. iv. c. ii. § 14; but for the other view, B. ii. c. viii. §§ 15, 16. These chapters are worth studying, not only as an exposition of Locke's real meaning in respect to sense-knowledge, but as illustrating strikingly how far he was indebted to and influenced by the doctrines of Descartes and Malebranche. "We may not think [as perhaps usually is done] that they [ideas of sensible qualities] are exactly the images and *resemblances* of something inherent in the subject; most of those of sensation being in the mind no more the likeness of something existing without us, than the names that stand for them are the likeness of our ideas, which yet, upon hearing, they are apt to excite in us." *Essay*, B. ii. c. viii. § 7.

But whatever doubt there may be in respect to the doctrines which Locke actually taught in respect to perception, there can be no question at all in respect to the construction which other writers gave them, or to the inferences which they derived from the principles which they imputed to him.

§ 202. Berkeley (*Principles of Human Knowledge*, § 18 *seq.*), assuming that ideas only are the direct objects of the mind's knowledge in sense-perception, concludes that it is impossible that the mind should know that the material or external world exists at all. It is impossible that the mind should know the objects which the ideas are said to resemble.

For, in the first place, one idea can only be like an idea, and can never be like an object; and second, if the idea was like the object, we could never know the likeness except by knowing both the idea and its object. All that the mind can know are its own sensations or modifications. The distinction between primary and secondary qualities is not well-founded. It is true we know that it is only on occasion of the ideas of extension, motion, and figure, that we have the sensations of color, taste, and sound. Ideas exist only so far as they are perceived. The laws which we conceive to govern material things, only govern the combinations of our ideas. Real objects, as we call them, are only combinations of ideas; the only difference between them and the so-called imaginary ideas consists chiefly in this, that the first are not dependent on our will to produce them, but are always present to our minds, whether we will or no. Imaginary ideas, on the other hand, come and go according as we will. Real ideas are also more lively and distinct, while those of the imagination are faint and confused. The knowledge of spirit is strikingly contrasted with that which we have of matter. We know ourselves and our own states or modifications directly. We know our thoughts, feelings, etc., not their ideas. That the universe is permanent in its objects—*viz.*, ideas—and also in its laws, is to be explained by this, that the Eternal Spirit constantly sustains and presents those ideas for the contemplation of created spirits. By means of these, the attributes and government of God are made known. All the things that we perceive, are the ideas of God.

Other idealists, as Arthur Collier, maintained the non-existence of the material world by similar arguments.

David Hume was not content to apply the ideal theory to the world of matter, but he maintained that it was as true of the world of spirits, rejecting the distinction made in favor of the latter by Berkeley, and urging that we know nothing of the mind except only the ideas which we experience, and dissolving all real existences into mere collections of ideas.

Berkeley, Geo.,
1684-1753.

David Hume,
1711-1776.

Berkeley's *Essay toward a New Theory of Vision*, 1709, was the most important contribution which he made to the theory of sense-perception. This was followed by *The Theory of Vision Vindicated and Explained*, 1733. In these essays Berkeley gave greater precision and fullness to the doctrine of the acquired perceptions. The fact that some of our perceptions are acquired was familiarly known and generally accepted before the time of Berkeley. It was generally held, however, that the acquired judgments were formed by means of the properties of light, as taught in the science of optics. This doctrine Berkeley sets aside, and clearly establishes the truth that it is by sensations attending the varied use of the eyes, by the confusion and clearness of the vision, etc., etc., that these judgments of distance and magnitude are formed, and that these judgments are wholly matters of experience of what is the ordinary course of nature. He insists that visible magnitude has no relation whatever to tangible magnitude, and that the act that we judge of one by the other is simply the result of experience; that vision, being limited to color, can give no idea of distance. He attempts to prove, moreover, that "the extension, figures, and motions perceived by sight are specifically distinct from the ideas of touch, called by the same names; nor is there any such thing as one idea, or kind of idea, common to both senses;" the so-called visible extension, or visible space, being totally unlike tangible space. Some of these extreme and paradoxical ideas have been abandoned, as unsupported by a sound physiology and psychology; but Berkeley's general doctrine of the acquired perceptions has been almost universally accepted (cf. § 142).

§ 203. The most distinguished opponent of the idealism of Berkeley and Hume was Dr. Thomas Reid, the father of the so-called Scotch philosophy. Being startled by the consequences which these writers derived from their construction of Locke's theory of sense-perception, he was led to review not only the doctrine of representative perception, but also some other principles which Locke was understood to advocate in respect to the origin and elements of knowledge. He attempted to supply some of his defects by establishing the authority of common sense, or intuitive reason, as an arbiter of philosophical truth, asserting that there are original axioms, or first truths, which are of independent and paramount authority.

In respect to sense-perception, he is less successful in stating and defending his own theory, than he is in criticizing the theories of the advocates of representative perception. At one time he distinctly asserts that we perceive material things directly, without the intervention of ideas. At another, he as distinctly asserts that, on occasion of certain sensations, the existence of these objects is suggested to the mind with an irresistible conviction.

In respect to the qualities of matter, he holds nearly the language of Locke, except that he denies that the primary qualities are either sensations, or resemblances of sensations. He says that we have a direct notion of them—that we know them as they are, but that of secondary qualities we have only a relative notion, knowing them only as the unknown causes of known psychical effects. But what we know directly in knowing primary qualities, he does not define. He does not tell us whether, in knowing solidity, we know any thing more of it than that it is the unknown cause of a sensation; nor whether we know extension and externality by direct intuition, or by indirect suggestion.

He does not correctly conceive and consistently treat the externality which is affirmed of the objects of sense. At one time he treats it as though it were the not-body, at another, as though it were the not-spirit, which is perceived directly. Not clearly conceiving and persistently holding a just conception of the problem to be solved, he failed to solve it satisfactorily. Strange as it may seem, the very act of perception which he is to define and defend, he does not consistently conceive of. At one time he treats it as though it was an act by which a quality discerned by sense is referred to an external object or assemblage of qualities, as sweetness is referred to the rose; at another, as the act by which the sweet odor is known to be, and to be distinct from the perceiving mind. In other words, he perpetually confounds the acquired with the original perceptions, though he was familiar with the distinction between the two.

Notwithstanding these defects and inconsistencies, his merits were great. He did not perfect a sound and consistent theory, but toward such a theory he furnished important contributions.

1. He successfully exposed the groundlessness, inconsistency, and contradictions of the ancient and modern theories of representative perception, and cleared the way for a theory more accordant with common experience and common sense. To establish to the conviction of all men the untenableness of a false theory is to perform no inconsiderable service toward the vindication of a theory that is true. *Cassan* and *Arnauld* both made the attempt to set aside the ideal theory, the latter with equal if not greater acuteness than Reid himself. What they only attempted, Reid successfully achieved.

2. Reid vindicated the general principle, that no theory of perception is entitled to confidence as truly philosophical, which contradicts the universal conviction and the common sense of mankind, when they apply their understandings to the judgment of truths which they are competent to decide upon. This was a special inference from the general axioms of Reid's philosophy. *Bufler*, in his *First Truths*, had laid down the same position, and had also vindicated the trustworthiness and authority of sense-perception, but with less fullness and less success than Reid.

3. Reid insisted that the mind is active in sense-perception, and did this with an earnestness rare among philosophers not only of the English, but of any school whatever. The ancients, and the moderns before him, did indeed assert that the mind is active in its higher functions; but they as distinctly denied that it was active in the lower. It has been nearly the uniform doctrine of all the schools that, in sense-per-

ception, objects act upon the mind so as to impress ideas, and that, in the reception of these ideas, the mind is chiefly or wholly passive. Against this doctrine Reid occasionally protests, in language like the following: "An object, in being perceived, does not act at all. I perceive the walls of the room where I sit; but they are perfectly inactive, and therefore act not upon the mind. To be perceived is what logicians call an external denomination, which implies neither action nor quality in the object perceived. Nor could men have ever gone into this notion that perception is owing to some action of the object upon the mind, were it not that we are so prone to form our notions of the mind from some similitude we conceive between it and body."

To this Hamilton takes exception, that the reasoning is not original with Reid, and that the language is not sufficiently qualified. Both are doubtless true, but the value of the remark is not thereby diminished, nor is the sagacity of its author. Arnauld had insisted, in a similar way, that the mind is active in perception, but the assertion had scarcely been heeded.

4. As intimately connected with the preceding, Reid asserts that the faculty and act of judgment are present in connection with the perceptions of sense. "In persons come to years of understanding, judgment necessarily accompanies all sensation, perception by the senses," etc. True, Reid was not original in this; for Malebranche, Arnauld, and Buffier had asserted the same. It may be said, even, that the schoolmen taught the same doctrine, when they introduced the higher intellect to complete the process of perception. Reid scarcely acknowledged the presence of judgment, except in the sphere of the acquired perceptions; only in his doctrine of suggestion he provided for it a place in the original intuitions, and in this made some advance upon the previously-accepted theory.

5. Reid recognised and enforced the distinction between sensation and perception, and thus prepared the way for the correct and completed determination of the two elements in the process. The older philosophers distinguished between the element of sense and the element of intellect. But they kept the two so far separate, as not to allow their presence in the act of original intuition, and so failed to recognize that intimate relation between the two, which the facts of experience attest and vouch for.

§ 204. *Dugald Stewart*, the successor of Reid in the school of Scotch philosophers, followed closely and almost timidly in the footsteps of his predecessor, whom he greatly admired and revered. He adopted the views of Reid in the main, but introduced greater precision into the distinctions which he established, and somewhat enlarged the range of the questions which he had started for discussion. In these ways, without contributing any new matter to the correct theory of sense-perception, he rendered very important services toward its final determination. He stated the questions more clearly, drew the distinctions more precisely, materially enlarged the range of observation, and enabled succeeding philosophers to face more distinctly the problems which needed solution.

1. He discriminated more carefully between sensation and perception than Reid. He limited perception to the act of apprehending the objects appropriate to each separate sense, and escaped the confusion and ambiguity which Reid committed, of confounding the original with the acquired perceptions.

Of three of the senses—smell, taste, and hearing—he denied perception altogether in fact, though not in form. He expressly asserted that these, by themselves, give no information of external objects (*Outlines of Moral Philosophy*, § 16). He asserts that the sensation of color, even as given in vision, can reside in the mind only, and is purely subjective; giving no relation of extension, and in our early experience clearly separable from it. It is connected with the primary qualities by a necessary belief of the mind; and so readily does the one suggest the other, as the mind is developed, that we conceive of color as spread over the surface of bodies, under the influence of an insurmountable association. (*Elements*, V. li. c. i. § 2). He even suggests that the primary qualities, as extension and figure, are attended by sensations of their own, which perform the office of signs only, without attracting any notice to themselves; so that, as they are seldom accompanied with either pleasure or pain, we acquire an habitual inattention to them in early infancy, which is not easily surmounted in our maturer years. (*Outlines*, etc., § 82.)

Whatever may be thought of the correctness of these views, it cannot be denied that they served to draw more finely and to render more exact the distinction between sensation and perception, as well as to bring out more distinctly the truth, that perception has chiefly to do with the two relations of externality and of extension; and that the chief question which we need to answer in respect to perception is this: How and when does the mind apprehend objects as external and extended?

2. Stewart apprehended, far more clearly than Reid, the true character of what he calls the mathematical affections of matter, and the relation of these affections to space and to our belief in space as a necessary existence. These mathematical affections are extension and figure, and are distinguished from the other primary qualities, such as hardness or solidity, and are thus characterised: 1. They presuppose the existence of our external senses. 2. The notion of them involves an irresistible conviction of the external existence of their objects—viz., of space. 3. This conviction is neither the result of reasoning, nor of experience, but is inseparable from the very conception of it, and must therefore be considered as an ultimate and essential law of human thought. (*Phil. Essays*, chap. ii. § 2.)

These remarks of Stewart in respect to space and extension are more discriminating than those of Reid upon the same topic, and bring distinctly to view the distinctions and problems which are necessarily involved in a complete theory of sense-perception.

3. Stewart adds to the doctrine of Reid, that we believe in the existence of the material world, by a necessary suggestion. The explanation of our belief in its permanence, he finds in our more comprehensive belief in the permanence of the laws of Nature. Intuitive suggestion would give us only the present existence of objects correspondent to our sensations. But we also need some ground of our belief in their permanent existence, and this is given in the more comprehensive intuition which concerns the past and the future, as well as the present.

The authority and the necessity of this intuition were recognised by Dr. Reid, but the application of it to the completion of the act of sense-perception was original with Stewart. Further reflection would doubtless have led him to acknowledge, that no act of sense-perception can be complete without involving also some process of induction. But in recognising the necessity of this principle, Stewart elevates the act of perception from a passive receptivity to an active energy, and also does justice to one of the intellectual elements which are necessary to make it complete.

§ 205. Dr. Thomas Brown followed in the same school with Reid and Stewart. He pushed the distinction between sensation and perception to a greater refinement than Stewart had done, and went so far as to reject altogether the distinction between the primary and the secondary qualities. The analysis which he has given of the processes and the products of the sense-perceptions, is the boldest and one of the most subtle which is to be found in the whole compass of English psychology. Whatever opinion may be formed of the soundness of Dr. Brown's opinions, he cannot fail to receive credit for the ingenuity of this analysis.

1. Dr. Brown attached great importance to the muscular sensations. He was one of the earliest of English psychologists to recognise and to distinguish them from the sensations as usually accepted. This distinction is now almost universally adopted. Dr. Brown made so much of these sensations, as to derive from these alone the notions of extension and of externality. He not only insisted, with Stewart, that the sensations of color are independent of and need convey no notion of extension, but that even the sensations appropriate to touch are as truly subjective, and that both suggest the extended and external object only through an inveterate association.

The process or method by which the muscular sensations give extension, is thus explained: In the contraction and expansion of any of the muscles—as, for example, those of the hand—there is a succession of similar feelings, each of which, taken singly, would be only a subjective state of the soul's experience, or a simple sensation. But when these are contemplated in a succession or series—that is, when they are connected in time so as to be reviewed by the memory—they suggest at once one of the dimensions of space, or extension. The muscular sensations alone are competent to this, because they alone are capable of producing many repetitions of the same series. Hence, to these is limited the office of giving extension, and of connecting our other sensations with space, and with objects in space.

The manner in which the muscular sensations were supposed by Brown to acquaint us with an external object, has already been explained and discussed (§ 130).

The critical inquiry must suggest itself to any mind: Why may not the muscular sensations be as truly and entirely subjective as any of the sensations proper? If one such sensation, taken singly, is purely subjective, why not a series? How can it be that a series of such sensations, in the order or relation of time, should become even the occasion or suggestion of relations of place or space?

2. It is obvious from this analysis, that Dr. Brown scarcely recognises the distinction adopted by Reid between sensation and perception. So far as the original perceptions are concerned, he rejects it altogether, as indeed he must, perforce. The only acts of perception which he acknowledges or describes, are acts of acquired perception. It is only when through the muscular sensations we are furnished with external and extended objects, that we learn to attach to these our several sensations.

Indeed the language which Brown habitually uses, expresses his rejection of the fact of perception. He speaks of our *feeling* even of extension, as though, because the act of the mind were performed by the mind itself, therefore the act must be wholly or chiefly subjective; in other words, because the mind is subjectively active in knowing, it can only directly know its own states, and never an object differing from itself or its own modifications.

He refers our belief in the external and material world to the principle of causation. We know our sensations as subjective states of the soul. We believe that they must be produced by a cause. We know that they are not caused by ourselves. There must be causes other than ourselves. These causes are material *non-egos*. The existence of these non-egos is not suggested directly, as Reid teaches, but it is inferred. "Perception, then, even in that class of feelings by which we learn to consider ourselves as surrounded by substances extended and resisting, is only another name, as I have said, for the result of certain associations and inferences that flow from other more general principles of the mind" (Lec. 26, cf. § 130).

When Brown makes such frequent use of the principle of causation in his theory of sense-perception, we ought not to fail to remember that his views of causation are peculiar, both in respect to the nature of the relation itself, and the ground of our confidence in its necessity and universality. The remark is equally applicable to all his followers and to the disciples of kindred schools, particularly to the doctrines and definitions of J. Stuart Mill, concerning sense-perception and its objects.

3. It is equally clear that Brown, to be consistent, would reject nearly or altogether the distinction

between the primary and the secondary qualities of matter, as explained by Reid, and in part adopted by Stewart. He maintains that there is a certain propriety in the distinction, but that it is not given by our original perceptions themselves, but only arises upon reflection. It is only by a secondary and artificial process that we reach the belief of extension and extended objects. The distinction between the primary and secondary qualities must necessarily be subsequent to this belief.

Dr. Brown founded no school, in the proper sense of the word, but his doctrines have had no little influence in respect to many important questions in psychology and philosophy. The associationalists and the cerebralists have, in many points, reproduced his views, and refer to him as a high authority. James Mill, 1773-1836 (*Analysis of the Phenomena of the Human Mind*), follows him very closely in the subjective and sensational character which he gives to our knowledge of matter, and in the resolution of the higher acts of intelligence, as well as of the belief in time and space, and in all necessary truths, into the law of association (cf. Chaps. II., III., and XI.) John Stuart Mill, the son, follows close in the steps of both, in his definitions of sensations and of material objects (*Logic*, B. I. c. III. § § 3, 4, and 7. *Examination of Sir William Hamilton's Philosophy*, etc., chaps. XI., XII., XIV.) With him also agree, in these common peculiarities, received from Dr. Brown, Alexander Bain (*The Senses and the Intellect*), and Herbert Spencer (*Principles of Psychology*).

Sir William
Hamilton,
1788-1856.

§ 206. This deservedly eminent and excellent Professor of Logic and Metaphysics in the University of Edinburgh, was one of the greatest philosophers of Great Britain. He devoted his researches to two leading topics: Formal Logic, and the Theories of Sense-perception. He had studied the history of these theories with greater care than any one of his own time, and had gathered from his historical researches the

most valuable results in the way of observation and analysis. His contributions are important in respect to all the points which have been noticed.

1. Sensation and perception were more carefully discriminated by him, as to their nature and material relations, than by any philosopher before his time. They are viewed by him as inseparable elements of a single mental state, and are called sensation and perception proper. Sensation does not precede perception in the order of time, nor of conscious experience, though it is its essential condition, so far, at least, that no perception is formed except in connection with an excited sensation.

But though these are inseparable elements, and are always present in the apprehension of every material object, they are not active with the same energy or intensity. As a general rule, the energy of the one is inversely as that of the other.

Further, sensation and perception, as co-existent elements of the same mental act, are contrasted as special acts or experiences of feeling and knowledge; with this difference, however, that sensation proper is an affection not of the soul only, but of the body as united with the soul, or, more exactly, of the organism as animated by the soul, and otherwise made capable of sentient experiences. Sensation, as experienced in the organism, necessarily involves the relation of relative locality; it being impossible that a sensation should be experienced, and yet not be placed with more or less distinctness in some part of the organism.

It may here be observed, that, however correct Hamilton may be in the view that sensation is necessarily placed—i. e., experienced under some relation of extension, the question will at once occur, how far this position is consistent with the other position, that sensation proper and perception proper are contrasted as feeling and knowledge. An affection experienced with some apprehended relation of place, must include some object and act of knowledge; and, if so, then the two are only ideally conceivable, as reciprocally knowledge and feeling. Rather, the classification should be threefold, into knowledge, feeling, and sensation; the last partaking somewhat of both. According to his classification, the soul should be treated as endowed with the power of sensation or sense-perception, knowledge, emotion, and will. If this classification is adopted, the phenomena of sense-perception must be referred to the joint action of sensation and knowledge; knowledge, in its appropriate and higher forms of action, being co-sensually involved in the apprehension of material qualities and material objects.

2. Hamilton asserts that sense-perception involves the action of the intelligence in the form of judgment, or the discrimination of relations. It follows of necessity that, in perception, man is active, and not simply receptive or passive. These important truths Hamilton enforces on every occasion.

He is not, however, sufficiently explicit in showing the variety of acts of judgment which are involved in the several processes of sense-perception, from the most elementary to the most complicated. Nor does he state how the act of perception, which is also an act of judgment, can possibly differ from an act of thought. In defining the elaborative faculty, or the power of thought, he makes it to be the faculty of relations. But sense-perception, so far as it involves judgment, knows objects in their relations, and is so far coincident with the higher power of thought. The only possible ground for discriminating the two, is in the fact that the presentative power apprehends and judges individual objects, and the elaborative power apprehends and judges objects which are general, and the relations which they involve.

3. In respect to extension and space, Hamilton teaches, with Kant and a multitude of others, that, while the special relations of every material body are known by sense-perception, yet space itself is presupposed by the intuition of the intellect, in order that it may be possible for all of these relations to be perceived as actual. Space must be known *a priori*, in order that extension may be known *a posteriori*.

Moreover, he teaches, as has already been explained under No. 1, that all the senses involve the relation of extension, some with greater, and others with less definiteness, and that it is absurd, and contrary to experience, to teach that the sensations of sound and smell are purely spiritual affections.

The extension which is apprehended in the original acts of sense-perception, is primarily the extension that pertains to the portions of the sensorium which are excited in a determinate way. The space-relations which are affirmed of material objects, are indirectly apprehended and acquired.

4. In respect to externality, Hamilton teaches positively though not with so great clearness as is desirable, that the term is used in two senses: (1) as denoting the diversity of the sentient organism from the perceiving intellect; and (2) the diversity of material objects from the material organism which the soul animates, and by which it apprehends.

In respect to the first of these relations, he asserts that it is directly apprehended in every act of sense perception—it being impossible that a sensation should be experienced without being apprehended as belonging to that organism which is diverse from, or external to the mind, as well as animated by it. This is a necessary element of the doctrine of natural realism, or of immediate perception.

In respect to the second, he teaches that it is gained by the exercise of the locomotive power in the form of muscular effort. This effort is resisted, and with the resistance is gained the correlative of a real-thing something, external to the body or sentient organism. "When I am conscious of the exertion of an enorganic volition to move, and aware that the muscles are obedient to my will, but at the same time aware that my limb is arrested in its motion by some external impediment, in this case I cannot be conscious of myself as the resisted relative, without at the same time being conscious, being immediately percipient of a not-self as the resisting correlative."

We do not doubt that the exercise of muscular effort has an important agency in enabling the mind to apprehend externality of material objects; but we cannot agree with Hamilton, that it attains this knowledge in the way or on the sole conditions in which he asserts that it does; or that, if it did, this would be properly termed an immediate perception. The conditions supposed are, that the mind should know its own muscular efforts, and distinguish itself as the cause of such "enorganic volition," in or over these efforts. But this distinction, if it be allowed to be real, is too subtle and refined to attract the attention at a very early stage in the mind's development. If it be possible to account for it by another and more natural process, it is far more rational to do so. Such a solution we have attempted to furnish, in the processes by which the mind combines the muscular and tactual perceptions, both of which are more likely to attract the attention at an early period, and are more rapidly distinguished than is the mind's spiritual activity, and its effects upon, or rather within the organism.

But if we suppose the process or the conditions stated by Hamilton to be correctly stated, the consequent apprehension would not properly be called "an immediate perception;" for it would manifestly depend on the application of the relation of causality. The conclusion would be reasoned out by the following process: Here is an effect of which I am not the author—*viz.*, an experienced resistance. There is no force known to me within the organism which is competent to produce it. That force must therefore be extra-organic, and external to my body. This is very different from the immediate perception of a correlative involving the apprehension of its relative. We grant that on the supposition that we apprehend one term of two correlatives, we must immediately apprehend the other. This follows by the force of logical necessity. But this logical discernment of an alternative is very different from the apprehension of a fact, or existing thing, which, when ascertained to be real, must of course be apprehended as diverse from another being.

5. The qualities of material objects are treated by Hamilton as though, as *qualities*, they were the direct objects of immediate sense-perception. This view is certainly implied in the whole of his doctrine, and his history of the sensible qualities of matter. At least, no hint is given of the contrary. And yet, strange as it may seem, Hamilton distinguishes these qualities, so far as they come within the sphere of psychology, as considered from the two points furnished by sense and the understanding, "the last principle of division" being "the different character under which the qualities, already apprehended, are conceived or construed to the mind as *thought*." We have to do with the first only.

A quality or attribute presupposes a substance to which it is related. It cannot be known as a quality except it be believed or known to be thus related. If, then, a primary quality is known as a *quality* by immediate perception, then it must be directly known to be related to its substratum or substance, and the relation of substance and attribute is discerned in every act of original perception. All this is implied in this doctrine of Hamilton. If it be conceded that this is true of the primary quality of extension, and even of the other—*viz.*, solidity—it has been shown that it cannot, by Hamilton's own showing, be true of the second-order primary qualities, which are comprehended under resistance or pressure; all of those, according to Hamilton, involving a relation to the locomotive energy of the percipient. As to the secondary, Hamilton himself abandons the position he had assumed, by in terms denying that they are objects of perception at all, being, as he justly remarks, the unknown causes of subjective affections in the percipient, and therefore incapable of being immediately perceived. Here we notice also an inconsistency, or, at least, an imperfection of statement. Sensation, in Hamilton's theory, is in no sense a purely subjective affection in the sentient. Color, sound, smell, are conceived of as affections of the animated organism, and color involves relations of extension and relative position

This is overlooked by Hamilton in his statement, though perhaps not in his conception, of the secondary qualities.

His doctrine of the perception of the qualities of matter, as qualities, is but another example, as it is a consequence, of his failure exactly to discriminate between perception and thought. The fact is, that immediate perception, if it can apprehend any qualities or relations of matter, can only apprehend those which belong to the animate organism, this being the first and only object of immediate perception.

6. Hamilton sometimes confounds the conditions of perception with perception itself. In general, he guards against such confusion. So learned an historian and so acute a critic of the theories of others could not fail to observe that no occasion of error had been more fruitful or dangerous than this; and yet, in some instances, he fails to guard himself wholly against its influence.

He yields to this snare in applying the doctrine of latent modifications of the mind to the phenomena of vision and hearing. He argues that, because two portions of extension, or two parts of an extended substance, each of which by itself is invisible, become visible when annexed so as to form one continuity, that therefore each of them, by itself, must obscurely affect the sensorium or the mind. So, two separate sounds, each one of which might be too feeble to be heard alone, when uttered together, cannot fail to be heard. In both these cases the distinction is overlooked between the action of physical or physiological stimuli upon the sensorium, and their effect on the sensorium as the appropriate and indeed the only condition of the responses of conscious sentience or perception. One or two sounds or sights might be too feeble to arouse the organism, when both together would excite it to action. It does not follow from this that either alone would affect the soul even obscurely.

More wonderful still is it that Hamilton does not take notice of the inconsistency in his own views of latent modifications of the soul. In commenting upon the phraseology of Leibnitz in such terms as *obscure ideas*, *obscure representations*, *insensible perceptions*, etc., he remarks: "In this he violated the universal usage of language. For perception, and idea, and representation, all properly involve the notion of its being, in fact, contradictory to speak of a representation not really represented, a perception not really perceived, an actual idea of whose presence we are not aware." (*Mss. Lec. xvii.*) And yet, when he argues against the doctrine of Stewart, he contends that objects may affect our consciousness and yet not be remembered. We contend "that this is impossible, and that it is more philosophical to suppose that we are not conscious of them in any sense." (*Lecture xviii.*)

Again, when Hamilton, in illustrating his doctrine that the immediate object perceived by vision is not distant, but in contact with the organ, he says the moon which we see is but "the complement of the rays of light as affecting the organism." What he intends is doubtless correct, but certainly it is not the light which we see in any sense as a physical agent, but what the light combined with the organism gives us, or produces for us; this, and this only, is the object seen.

When, also, he asserts that in such case "the external object is in immediate contact with the organ," and that in this sense it is true "that all our senses are only modifications of touch," there is a similar confusion of the conditions of the act of perception with the object actually perceived, and as actually perceived. Physically it may be true that in order that the object be immediately perceived, some physical thing or being must be brought into contact with the organ or the organism, but it does not follow, therefore, that what is perceived should be touched or known by means either of superficial touch or of muscular energy. That both of them may accompany every sense-perception with more or less definite apprehension, is true. A conspicuous example is the union of touch and taste in the sense-perceptions given by the tongue. But, as has already been shown, what is immediately perceived is the organism in a given condition of sentience. Touch, as giving the material object external to the organism, is an acquired, and not an immediate perception at all.

7. Hamilton attaches too great importance to the subjective sensations, or the idiosyncratic affections of the nervous system, which are excited by electrical action, indigestion, or a blow. The sparks which are elicited by a blow over the eyes, the light, the sound, the taste, the ringing of the ears which electric or other agencies occasion, are doubtless owing to a peculiar stimulus of the sensorium, and to this only. The occurrence of such phenomena demonstrates that similar phenomena when they continue longer and are more distinctly experienced, are owing to the power of external objects to excite the organism to a similar reaction; the sensation being dependent on the proper excitement of the energies latent in the organism. But the brief duration and the indefinite character of the sensations themselves, when contrasted with the continued existence and the definite consciousness of those sensations that give us the knowledge of existing things, show also that the power of the object to excite has quite as much to do with the result, as the capacity of the organism to be acted upon. The result is a product of their joint forces, both of which are equally essential to the issue, and the issue itself is the psychical act of such perception.

8. Hamilton's theory of perception is vitiated still further by the metaphysical assumption that we know directly only phenomena, whether of matter or of mind; and that the phenomena of either are relative to our faculties, which are themselves conceived as capable of variety and change, involving variety and change in the products or objects known. This theory, derived from Kant, is liable to the most serious objections, on general grounds and in other applications. So far as sense-perception is concerned, it is defective in that it assumes that phenomena, *as such*, are the direct objects, and the only

direct objects of the mind's knowledge. We hold that neither phenomena nor qualities, as such, are perceived, but objects, percepts, or beings; and that it is by an after-thought, or reflex process, that these are connected as qualities, and are referred to substances (cf. § 164).

2. The most eminent service which Hamilton has rendered to the theory of sense-perception, is his criticism of all the possible forms of the doctrine of representative or mediate perception, and his demonstration that every such theory is untenable.

We give the substance of his criticism in our own language, for the sake of brevity, interposing such qualifications and explanations as may serve to illustrate and explain it.

In respect to the act of sense-perception, one of two positions may be taken. The mind is endowed with the power of perceiving material objects by a direct and intuitive energy, without the intervention of any intermediate object; or, the mind can perceive material objects only through the medium of some intervening object.

It will here be observed, that the alternative does not relate to the conditions of such perception whether material or physiological. It is simply a question whether there are or are not intermediate objects in the psychological act.

If the first position be taken, then the only obligation which rests upon the philosopher, is to state the conditions which are essential to the act, and to analyze the act into its elementary constituents, as given in, or inferred from our conscious experience and careful observation.

The person who takes the second position is bound to show why this hypothesis is necessary. The natural and universal belief of mankind is, that objects are perceived directly. He who asserts that this is impossible, ought to give some reason for deviating from this belief. The several reasons that are to be found in the whole history of philosophy, are by Hamilton reduced to five groups, underlying each of which is a single fundamental principle. The first of them is, that an act of cognition is an act of the mind; and to suppose that the mind should know that which is not itself, is to suppose that it can go out of itself. To this it is replied: 1. That if we cannot explain how it is possible that the mind should act on that which is not itself, it does not follow that it cannot be a fact. The fact may be ultimate, and for this reason inexplicable. 2. The principle proves too much, for it will involve the inference that the mind cannot act upon matter, as it manifestly does in volition. 3. Moreover, it will carry with itself the consequence that matter cannot act out of itself upon the mind, and of course cannot produce a representative image of the object.

The second reason is, that mind and matter are substances not only of a different, but of the most opposite natures. What knows immediately, must be of a nature corresponding or analogous to that which is known; the mind cannot, therefore, know matter directly; an intermediate something must be interposed. This reason is of the widest prevalence, and underlies almost every theory of representative perception. It accounts for the great variety of interposed media which have been suggested by both ancients and moderns. When this medium has been akin to the mind, it has given the *intentional species* of the schoolmen, or the *ideas* of Malebranche and Berkeley. When it has been supposed to be identical with the mind, it has given the *gnostic reasons* of the Platonists, the *preexisting species* of Avicenna, the *ideas* of Descartes, Arnauld, Leibnitz, Buffon, and Condillac, the *phenomena* of Kant, the *external states* of Dr. Brown. To the influence of this assumption, are to be traced the systems of the absolute identity of mind and matter, of exclusive materialism on the one hand, and of spiritual idealism on the other.

This grand assumption is to be rejected as arbitrary, unphilosophical, and contradictory to our plain experience.

The third reason for this hypothesis is, that the mind can only know that to which it is immediately present. External objects can hence be brought within reach of the mind only by means of some representation intermediate. The proper answer to this reason is, that the mind is present in every part of the body so far as to act and to be acted upon, and that the real object of immediate perception is some part of the body as excited to a specific sensation. The correct view of the relation of the soul to the body, and of what is the real object of the mind's external perception, sets aside this third reason.

Reid and Stewart attempt to set it aside by a failure to conceive these points rightly, and they require some agency of the Deity, and an inexplicable connection between the sensation and perception, which is unphilosophical and unsatisfactory.

The fourth ground is stated by Hume, that the same object, as a table, at different distances changes its dimensions, but the object itself does not change; therefore the object must be apprehended by an intermediate and changing representation. To this it is answered, that the same table is not perceived, so far as vision is concerned, when near and remote, but a different object in each case is the immediate object of sense-perception.

The fifth reason stated by the elder Fichte is, that, as the will must act in view of intelligent objects, these must be within the mind; so far then as it acts in respect to material objects, these must be represented in the mind.

To this it may be replied, that the act of intelligence is in the mind, and that is all which is required as the condition of the act of will. Besides, the act of the will respects future results, which must neces-

early be mediate representation. It is not denied that the mind is capable of mediate knowledge. The question at issue is, whether the act of sense-perception is an act of this kind.

After having shown that this hypothesis of a representative perception is unnecessary, Hamilton shows at length that it does not stand the tests by which every legitimate hypothesis may properly be tried. These conditions are: (1.) That it be necessary, and be more intelligible than the fact which it explains. (2.) That it shall not subvert that which it proposes to explain, or the ground on which it rests. (3.) That the facts in explanation of which it is devised really exist, and are not themselves hypothetical. (4.) That it does not subvert the phenomena which it seeks to account for. (5.) That the fact which it seeks to explain must be within the sphere of experience. (6.) That it works naturally and simply. The hypothesis of representative perception fails to answer to any of these conditions, and must therefore be rejected by every true philosopher. *The Works of Thomas Reid, D.D., etc., etc. Preface, Notes, and Supplementary Dissertations, by Sir William Hamilton, Bart., Edinburgh, 1846; Lectures on Metaphysics, etc., etc., Vols. I and II, London, 1858; Am. Ed., vol. I., Boston, Gould & Lincoln 1860; Discussions, etc., etc., London, 1862; An Examination of Sir William Hamilton's Philosophy, etc etc., London, 1865; Am. Ed., 2 Vols., Boston, 1866.*

§ 207. If we pass from the schools of Great Britain to those of France, Condillac at once attracts our attention, for the interpretation which he gave to the principles of Locke, as well as for the special theory which he formed of the sense-perceptions. In his treatise on the *Origin of Knowledge*, 1746, he recognises sensation alone as the one source of our ideas. He leaves out of view reflection, and resolves all our spiritual ideas into sensations, as rendered more energetic by attention, and as recalled by the memory under the laws of association. In his *Traité on The Sensations*, 1754, he gives a subtle analysis of the operation of the several senses as acting singly and in combination. His *Logic* deserves also to be consulted for careful and precise definitions of the several acts of knowledge. But, the *Traité des Sensations* is remarkable for its ingenuity and its consistency, as well as for its oversight of some of the most important elements in the phenomena which the sense-perceptions involve. The doctrines of Condillac anticipate many of the views of Dr. Thomas Brown, of the school of Herbart, as well as those of the modern Cerebralists. Those most distinctive are the following:

1. The mind is passive in the acquisition of its sensations, because the cause which produces them, is from without; when these are recalled, it is active, because their reproduction is owing to a cause within, viz. the memory. In neither case is the mind conscious of effort. It knows only the different quality of its sensations. A strong sensation is ordinarily from a real object, a weaker one is recalled by the memory. All the conceptions which Condillac expresses concerning the sensations, are in entire consistency with this view. The human being is represented as a statue to which the several senses are supposed to be imparted or at least the capacities for experiencing them, beginning with smell and ending with touch. Each of these sensations is a purely subjective experience, indicating at first not even the *ego* which is the subject of them, much less the existence of the body, or the relations of extension or externality. The senses of touch and of sight are as entirely spiritual as the others; single sensations of each suggesting neither time, extension, nor externality. (*Traité d. S., p. l. c. II. § 11.*)

2. The modifications of the soul from present objects are sensations; the same, when recalled by the memory, are ideas. All ideas are simply reproduced or transformed sensations. A single sensation occupying the soul exclusively is a state of attention. Two sensations or ideas experienced together constitute comparison, and comparison involves judgment or the sensation of difference or likeness. But in attention, memory, comparison, or judgment, there is nothing required but the coming and going of sensations and ideas under the stimulus of association. All these, usually conceived as activities of the soul, proceeding from and referred to the personal self, are no more nor less than simple states of existence that are pleasant or painful, involving necessarily no reference to the subject of them by himself, or to an object not himself.

3. The knowledge of extension arises on occasion of the sensations of touch. Several sensations are experienced at the same time, as in the hand, the fingers, the stomach, and the feet. The soul cannot experience them distinctly, i. e. attentively, together, without separating them one from another—i. e., without viewing them apart, or as occupying space. But this feeling of extension is only vague, and without involving either the knowledge of any thing material, or of the measures of space. (*Traité, d. S. p. l. c. III. §§ 1, 2.*)

4. Body and matter are discovered by the application of the hands to the surface of one's own body, coupled with the experience of sensations within this surface. In this way the soul learns its own body, which is nothing but certain sensations of touch, bounded by others. Having learned its own body, it learns other bodies—i. e., material things. By moving its arms, and not finding objects within its reach, it gains its knowledge of space as distinguished from the extended objects which occupy it.

Material objects are simply collections of sensations, qualities being sensations only. The extended sensations of touch, or the sensations of touch conceived as extended, form the substance with which the other sensations are connected as qualities. Time is but a series of consecutive sensations along which the memory passes with ease by a ready association.

The Theory of Condillac is a theory that recognises sensations only, and does not provide for the

knowledge of the ego, or the non-ego, or for the apprehension of space or time. All the professed explanations of the origin of these conceptions, or of the time when, or manner in which they are gained by the mind, are inconsistent with Condillac's fundamental principles. The principles of his theory provide only for sensations, passing and repassing through the mind as shadows come and go over a field, and they exclude even the possibility of consciousness, much more of perception as acts of proper knowledge.

The theory of Condillac was that generally accepted in France for nearly three quarters of a century, till the beginnings of a better system, under Laromiguière, Royer-Collard and Maine de Biran.

Laromiguière, P. § 208. Laromiguière delivered lectures on philosophy in 1811 and 1812, in which, while seeming to supply certain defects in Condillac, he taught principles that were entirely inconsistent with his system. (*Leçons de Philosophie sur les principes de l'intelligence*, etc. Paris, 1836.)

First of all, he asserted the activity of the soul in the acquisition of all its knowledge. In sensation, he held that the mind is passive. But in acquiring knowledge by sensation, the soul is both active and passive, it being passive as sense and active as the understanding. The understanding is the common appellation for the three faculties of attention, comparison, and reasoning. Attention is always required in any act of sense-perception. Comparison and reasoning are necessary for many of the more complicated objects. The acts and ideas of sense-perception are the joint product of the sense and understanding.

Laromiguière does not discuss in detail the special conceptions or relations of extension and of externality, and, indeed, rather furnishes materials for a theory, than actually applies them.

§ 209. This distinguished philosopher and publicist exerted a far more powerful influence than Laromiguière on the theory of sense-perception, as he also did upon speculative philosophy. His lectures were delivered in the same years with those of his associate, and portions of them were published by Jouffroy in connection with his translation into French of the works of Reid. This was eminently appropriate,

inasmuch as his theory was suggested and matured under the impulse given by the perusal of Reid's *Essays*. It is in effect the same theory in its principles, only more exact and complete in its details. The additions which he made to it are similar to those which were suggested by Dugald Stewart, at a somewhat later period, but without the knowledge that Collard had made those which were similar. The contributions of Collard are, however, more in the spirit of a profound and exhausting system than those proposed by Stewart. The chief points made by him are as follows:

1. He distinguishes sensation and perception in the same manner, and with no greater exactness than Reid and Stewart. Sensation is co-extensive with all the senses, but perception is restricted to sight and touch—preëminently to touch.

2. In perception by touch we know impenetrability and extension, or a solid and extended something. But this is not all that we know. We proceed to affirm them as qualities or attributes of a substance which is not ourselves. In the sensation occasioned by a hard body, I am affected in a particular manner. This is the sensation; and I at once refer this to a something different from myself. But I do more: I confidently believe that this something existed before I touched it, and that it will exist afterward. I enlarge my knowledge still more; I believe that this enduring something is the cause of those modifications called sensations. My perception involves, therefore, the relations of externality, of substance, of duration, and of causality.

3. These conceptions or relations are attributed to the external world by a process termed *induction*, or *natural induction*. This term is substituted for the *suggestion* of Reid, and the propriety of using it is explained and justified by the analysis given of the process itself. For, according to Collard, it is in some sort a process, and not a simple intuition, such as Reid would make it to be. The intellect proceeds on this wise. It observes by consciousness what happens to itself. It is conscious of its own states as modifications of its own ego, or, in other words, it knows the relation of attributes to substance to be true of itself. In like manner it knows itself to continue to exist, and thus is aware of itself as enduring. Moreover, it knows itself to be the cause of its own actions. Finding these relations of substance, duration, and causation in its own inner experience, it transfers them to objects without, by what Collard calls *induction*; which is not, however, founded on probable evidence, or conducted by analogy, but necessary and original to the soul.

4. In a way similar to that in which unlimited and necessary duration is affirmed on occasion of the experience of limited time, we pass from the limited extension of which we are cognizant by touch to unlimited and necessarily existing space. This also is by *induction*.

It is not till external objects are thus known in all these relations of substance, space, time, and causality, that perception is accomplished.

5. The reference of those qualities which are thus known by conscious modifications and relations of the soul itself, to the objects which have been previously perceived, is a subsequent process, and hence these qualities are said to be secondary, while the others are called primary. Whether color is a primary or secondary quality, Collard does not discuss nor decide.

§ 210 This profound and noble thinker was intimately associated with Collard in 1811-'19—years so memorable for the dawning of a better philosophy in France. He justly deserves to be called the most profound and original French metaphysician of the present century. He made some important contributions to a better theory of sense-perception.

1. He boldly asserted and successfully defended the activity of the mind in sense-perception. It was the central doctrine of his philosophical system, that the mind knows itself as an agent or cause. To the vindication and inculcation of this truth he devoted his chief energies, and for the original and independent manner in which he reached this position for himself, and developed it to others, he merits the honors of a discoverer and an eminent philosopher. In sense-perception, he held that the mind is as truly *active* as it is *passive*; and it is by distinguishing between its passive reception and its active exertion that we are enabled to explain the various phenomena which require solution. The mind knows itself as an individual cause or agent. This knowledge is distinct from that which it has of itself as a substance, as well as from its knowledge of substance in general. We begin with this as a datum. We know this fact by inner experience. We exercise individual force in individual activities. We know this fact best and most certainly of all facts, and we constantly employ and imply it in all our other knowledge.

2. He made great advances toward a correct view of the physiological conditions of sense-perception. The element furnished by these conditions, he sharply distinguished from that contributed by the mental or psychological agent. His physiological views are far more profound than those of Descartes. He is preëminent above Locke, Reid, Stewart, Brown, and Collard, in conceding to physiology all the share of influence which it can reasonably claim in the phenomena of life and sensation, while he asserts for the intelligent soul a distinct and appropriate energy.

He insists, with emphasis, on the reality and importance of the purely vital functions; on the action and reaction which the appropriate vital stimuli produce and excite, in sustaining and furthering the life of the body. He recognizes also all the physiological conditions of sensation, and their capacity to affect the mind with more or less energy, and to be affected and directed by the mind's own active intelligence. In the writings of Maine de Biran, physiology first receives proper recognition and due honor, without being suffered to encroach upon the limits of psychology. Whether or not his views of physiology would all be accepted, those which are most essential are well-founded, and for the first time find their just recognition in the philosophy of sense-perception.

3. He distinguishes and accounts for the origin of the two relations of externality which are involved in sense-perception. The diversity of the organism from the spirit or ego is given by the manifest distinction recognized by the mind between the affections of its own causative energy and those of the organism which often resist this energy and stimulate it to reaction. The exteriority of material objects to the animated or ensouled body is discerned through the muscular effort which the active soul is capable of employing, and to which it is stimulated by the reflex activities of the body itself. This muscular effort tending toward, or productive of effects as directed by the intelligent and active ego, is resisted by other agents than the organism which it animates and controls. The mind attributes this resistance to another cause than itself, by *actual induction*, or by the analogy of its own experiences, transferred to objects in space other than the man himself (Hamilton, *Works of Reid*, note D).

The mind knows itself not only as a cause, but as a permanent cause. Through this, or in connection with this, is given the apprehension of *time*. The knowledge of the organism with which the soul is connected, gives or occasions the belief in *space*. How, or by what process, Maine de Biran does not explain. He simply asserts the fact. He attempts no solution of the accompanying belief that both space and time are unlimited.

4. He made more subtle and precise the distinction between sensation and perception. The human being, as body and soul, comprehends what may be distinguished as four distinct systems: the affective, the sensitive, the perceptive, and the reflective. The affective system includes those bodily capacities of being affected and of counter action, which are essential to the functions of life and of health; many of which, through the intimate connection between the vital organs and the organs of sense, exert an indirect but a most powerful influence over the sensations themselves. Thus the various causes of a given condition of the brain or stomach or nerves, which in their operation and effect are wholly beyond the range of our sensitive appreciation, may directly or indirectly bring the organs of sense-proper, or these very organs when they become sentient, into a condition involving special sensations of pleasure or pain, or one modifying the quality or intensity of these sensations.

The sensitive system is the capacity to be pleasurably or painfully affected by the soul as connected with the extended organism, either by simple reception of a stimulus, or the counter action to which the stimulus excites. As the sensation is always pleasurable or painful, it is attended with some reference by the subject of it, to the ego which enjoys or suffers. But this may be the most indefinite possible, and, so far as it is simple sensation, it involves the vaguest knowledge of the ego—knowledge so vague, that the individual is not distinguished as an individual—nor is it separated from the extended organism with which it is united. Into this state we tend to sink back when we fall into faintness or sleep, or when delirium renders us incapable of definite knowledge or the assertion of individual energy in the

control and direction of the organic self. These sensations, and this sensational life, have laws of their own, according to which every sensation experienced leaves an influence, partly affective, in the body only, partly sensational in the sensory, predisposing both to act again with more readiness in response to the appropriate stimuli, and laying the foundation for greater ease in repeated and habitual action, as well as for the return of associated sensations in dreaming and delirium. The lowest form in which the sensational life is manifest, is in the so-called latent or dream sensations. None of these are wholly unrelated to the ego, but they are known only by the feeblest and the most passive cognition.

The perceptive system begins its activity when the active ego knows and directs itself as a cause. By this criterion it distinguishes itself from its passive affections, makes definite and distinct its sensations in the different parts of the organism, and refers them to organs. It also distinguishes external objects from the organism, fixes them as beings in their places in the external world, and assigns their activities, as well as its own, to their positions in the series of time.

These two elements—the sensitive and the perceptive—are combined so closely in our actual experience, that we do not distinguish them from one another. Each element acts also with varied intensity, so that we are capable of conditions varying from the purest and most passive animal sensation in which there is scarcely the smallest ray of intellectual activity, to that of the purest and most spiritual intelligence in which source a vestige of sensation remains.

It is easy to see how, from these fundamental data, De Biran would evolve the distinction between the primary and the secondary qualities of matter. Those properties which are referred to their external causes or objects by direct and necessary cognition, are the primary qualities. Those which are indirectly, and by a secondary act of reflection, referred to those agents or causes which have already been defined and determined, are secondary.

These views of M. de Biran produced a powerful influence upon the French philosophers of his own and of the succeeding generation. Where they were not accepted and reasserted in their detail, they were in their principles and most important results. Cousin devotes but little attention to any psychological analysis of sense-perception. He is chiefly occupied with the more comprehensive relations of speculative philosophy. He has taken into his system a single feature of De Biran's theory of the perception of externality. Jouffroy did little more than apply the results reached by De Biran in the sharp and well-sustained distinctions which he drew between physiology and psychology.

§ 211. In Germany, *Leibnitz* is the earliest writer who attracts our attention. He was more of a metaphysician than psychologist; and yet he contributed some important hints to the theory of sense-perception, which have been worked out and applied by the modern school of Herbart. His follower, Christian Wolf, wrought out his principles into a system of psychology, in which the definitions are very exact, and the doctrines of his master are rigorously and consistently developed and applied. We have already noticed the doctrine of a preestablished harmony between certain states of the body and the corresponding affections of the mind, which Leibnitz urges, to avoid the doctrine of occasional causes, or of the constant interference of the Deity in every perceptive act. The doctrines of Leibnitz, in respect to sense-perception, are in his *Nouveaux Essais, Theodicæ*, and *Monadologie*. Those of Wolf are given in the *Psychologia Empirica* and *Psychologia Rationalis*, Frankfort and Leipzig, 1732 and 1734.

The peculiar doctrines of this school may be stated under the following heads:

1. *Definitions of sensation and perception.* Sensation is the power or faculty of perceiving external objects by means of the changes which they produce in the corresponding or appropriate organs of the body. Perception is the power which the mind has of representing any object to itself. Sensation and perception are distinguished as a generic and specific kind of knowing. By the one, the mind knows or represents any objects whatever. By sensation, it knows objects by means of changes effected or indicated in the bodily organs. These significations are those to which these terms are limited. The conceptions appropriated to the two terms are not clearly, certainly they are not forcibly distinguished. Indeed, there is scarcely a trace to be found of the conception of sensation as the pleasurable or painful subjective affection of the soul which conditions perception. This is entirely consistent with the general doctrines of Leibnitz. The function of feeling in general, and the several kinds of feeling in particular, were all resolved by Leibnitz and Wolf into different sorts of perception or representations by the mind. Cf. *Nouveaux Essais*, B. II. c. viii. § 15, for the remarks respecting the resemblance or correspondence between pain and the motions of a pricking pin. Appetite—i. e., conative feeling—is the tendency in the monad, of one perception to another.

2. The act of perception is *representative*, and the result is a *representative idea*. This is a special application of Leibnitz's doctrine of monads. According to this doctrine, the universe of matter and spirit consists of monads, or ultimate particles, each endowed with a power to represent, or respond to every other monad, in accordance with its individual nature. Material things or objects, as we call them, consist of a number of these conjoined. A spirit is a single monad, of far higher powers to represent than the monads which are material. What Leibnitz intended by the word to represent, is not easy to decide; and it seems necessary to believe that he intended by it to signify only, to be affected by, to act, and to react, to have a relation to. Cf. *Nouv. Ess.*, B. II. c. 2, § 15. "De la ressemblance et rapport exact," etc.

In accordance with this general definition, an act of knowledge or perception is defined to be the representation as one, of that which is manifold or composite. The soul by reason of its superior nature, has the power to represent or reflect as one or as a whole, the composite material universe, more or less perfectly. Portions of the same it can do with a still greater degree of perfection—i. e., such as are near and strongly affect the organs of sense.

By perception, we gain sensuous ideas. These represent to us only figure and size, situation and motion. It would seem from this that all our perceptions are of relations of extension only, and that our perceptions of color, smell, etc., might be resolved in the final analysis into the discernments of different motions or positions of the particles in the objects, their medium, the organ of sense or the brain. This is the only possible construction which can be put upon much of the language of Leibnitz and Wolf. If this construction is correct, it is obvious that they entirely overlooked and confounded the distinction between the conditions of a sense-perception and the consequent affection of the soul. That they could have done so, is rendered probable by the circumstance that Locke often does the same; that multitudes of physiologists are, at the present day, committing this identical mistake; and even those psychologists who appear to know better, are perpetually falling into it. That Leibnitz should have done so, is the more probable if we reflect on the real import and logical tendency of his doctrine of monads, so far as it could be used to explain psychological phenomena. That this is the just interpretation of his views, will be obvious from the importance attached by him to the distinction between obscure and distinct perceptions.

For Wolf's definition of *idea*, see *Psych. Emp.*, § 48; of a sensuous idea, *id.*, § 95. For his doctrine of representation, see *Psych. Rat.*, §§ 91, 92. Wolf's language can only be construed as teaching the doctrine of mediate knowledge in its grossest forms, the sensuous image being like the material image, and the material image like the material object.

3. *Gradation of Perceptions.* The perceptions are clear or distinct, on the one hand, and obscure or confused, on the other. Examples of the latter are such as we experience when we are giddy or faint, or are just awaking from sleep. Such, in a greater degree, are experienced in profound sleep without dreams.

Our ordinary perceptions, when at all distinct and definite, are examples of the former. When to this distinct objective cognition, the mind adds the distinction of the *ego* from the *non-ego*, perception becomes apperception. Hence, apperception is sometimes defined as the reflective or conscious knowledge which the mind has of its own states, and sometimes as the knowledge of the non-*ego*.

Every act of clear perception is attended by the obscure perception of many objects. Often it happens that the obscure or confused perceptions need only a slight addition to render them distinct, as "the perception of light or of color which we apperceive is made up of a great number of slight perceptions which we do not perceive separately, and a noise which we perceive but do not notice (apperceive) becomes apperceptible by a slight addition." It is by the superior capacity which the human has above the brute-soul, as well as by the greater perfection of its bodily organization, that his apperceptions are so much superior to theirs. It is because he perceives so large a portion of the universe so obscurely that he is inferior to the Deity.

The doctrine of obscure perceptions figures very largely in the psychology of Herbart, who also adopts many other of the principles of Leibnitz. M. de Biran makes a free use of his principles, though in his hands they often serve to point to a better and sounder application, and as clues by which he is guided to the truth of which they are but exaggerated and one-sided statements. Hamilton also accepts it in part, but adopts it with less than his usual discrimination and caution, *vide Met. Lec.* 18.

4. *Externality and extension.* Every apperception gives the relation of externality in the way explained under No 3. As to the relations of extension and space, these can only be understood by Leibnitz's peculiar theory of both space and time. Space and time, in his view, are purely relative, and space is defined as an *order of co-existences*, or as the relation between *co-existent objects*. It must follow that, as soon as two objects are distinguished by an act of apperception, and are also apprehended as co-existent, they must be known to exist in space. The apperception of two such objects together, as *non-egos*, of course involves the apperception of their relation to one another, which is nothing else than the space which the mind must distinguish from itself.

§ 212. *Tetens*, (John Nicholas,) Professor of Philosophy at Kiel, in his *Philosophical Essays upon the Nature of Man and its Development*, distinguished himself as one of the most sagacious and profound philosophers which Germany has produced. In some very important points he corrected and set aside the views that were received from Leibnitz and Wolf.

His principal work, which was the manual of Kant, is entitled *Philosophische Versuche über die menschliche Natur und ihre Entwicklung*, Leipzig, 1772. Tetens deserves to be called the Reid of Germany, for the good sense with which he thinks and the clearness with which he writes. But he is far superior to Reid (whom he criticises with great acuteness) in philosophical learning, as well as in the originality, subtlety, and sagacity of his thoughts.

Tetens vindicates first of all the reality of the distinction between feelings and cognitions, as against Leibnitz. He distinguishes between the emotions which are purely spiritual and the sensations which are bodily. He distinguishes also between perception as the cognition of any *non-ego*, and the

apperception of a definitely cognized completed material object, or complex of percepts united in a whole. He shows that perception, in its lower and higher forms, involves the activity of the judgment. He insists that the mind, in all intellectual functions, is active. All these were very important, and for their time extraordinary contributions to the theory of perception.

His theory is at least questionable in some points of detail. While he distinguishes between sensation and perception, he at times makes sensation itself a kind of perception, as when sensation itself is described as apprehensive of objects. Some of his language would seem to imply this. On the other hand he distinguishes between the pure sensation and the intellectual cognition or consciousness of it, and finds, in the longer or shorter continuance, and the more or less definite character of different classes of sensations, the reason why some are necessarily referred to external objects by an intellectual judgment, and others seem to be merely subjective affections. It is never the original sensation, but its prolongation or repetition, which leads to perception. The *non-ego* of Tetens is uniformly the *not body*, as contrasted with and distinguished from the embodied spirit.

§ 213. *Kant*, the great metaphysician of Germany, has treated of sense-perception only indirectly. He has given no formal theory of its processes, but has metaphysically analyzed its results, and thus has indirectly taught a partial theory of the power itself and its functions. First of all, he implies that the soul, in its sense-perceptions, is passive or receptive only. He contrasts the receptivity of the soul in sense with its activity or spontaneity in the understanding. He indirectly teaches, by the assumptions that underlie his whole system, that the process of sense-perception is not complete until the understanding, by the judging power, conceives under some of its forms, the matter given by sense. Had he distinguished between the natural judgments which concern individual things and their relations, and the secondary judgments that contemplate general conceptions, there could be little to object to in his theory; but this omission is fatal to its completeness and its truth. Sense stands on the one side as a purely passive receptivity of individual objects, and the understanding, on the other, as active indeed, but as concerned with generalized concepts alone.

Of the relation of sensation to perception, Kant teaches that sensation gives the matter, and perception—*i. e.*,—intuition—furnishes the form. The form essential to any and every act of external intuition is space. All material objects, so far as they are perceived at all, are perceived in some relation to space—that is, they are perceived as extended objects. Kant recognizes this as a fact of actual experience. But the facts he subjects to no further analysis, least of all does he examine farther the process by which the product is reached. Instead of studying the fact in its conditions and elements, he seeks to account for its possibility and the trustworthiness of its results, on the ground of speculative philosophy. For this reason, his discussion of space has an intimate relation to the theory of sense-perception, and the conclusions which he reached have entered into the discussions of all physiologists and psychologists since his time. This conclusion was, that space and time must be assumed as the necessary conditions of our subjective experience in both consciousness and perception, yet we are not thereby authorized to believe in their objective reality. We cannot, indeed, perceive any material object by means of the senses without involving necessary relations to space directly, and indirectly to time. It does not, however, follow that space is a reality. It is supposable, though not to us conceivable, that to minds constituted differently from our own, the forms, with the relations which they involve, should not be necessarily assumed. *Kritik der reinen Vernunft. ER. lehre, II. Th., 1 Abth.; II. Buch, 2, Hauptst. 3 Abschn.*

In respect to the reality of external objects, Kant recognizes the fact in our psychical experience, that material objects are not only perceived as extended and spatial, but also as external; or in other words, as *non-egos*. In sense-perception this distinction is necessarily involved. The act includes this as an essential element in the process, and its result. It does not follow, because the mind makes this distinction, that there is a reality corresponding to this *non-ego*. (1) The *non-ego* as a being, is transcendental to all phenomena. (2.) It is posited in space which is necessary as a form of sense but which may be only an illusion. Kant undertakes to demonstrate, on the ground of speculative necessity, that this is impossible. He contends that we must assume that there is something permanent and real without, in order to account for the changing modifications within. Even the self, or *ego*, is not experienced as a permanent something. It is only concluded to exist as the thought-conception of a spiritual substance with capacities for spiritual acts. All that we are conscious of, are our changing modifications in time. These can only be rationally explained by a permanent reality which causes them. Of the existence of an external world, we can be rationally assured, but of it, have no direct perception.

The theory of sense-perception was discussed by the successors of Kant chiefly in its purely metaphysical relations. In the writings of Fichte, Schelling, and Hegel, still as attention is given to psychological analysis, metaphysical principles and relations being almost exclusively discussed.

§ 214. *Herbart*, on the contrary, though holding a definitely-conceived metaphysical system, has given great prominence to its physiological development and its psychological applications. His speculative views of the nature of the soul, of the elements of matter, of the nature of knowledge and its fundamental relations, of space and time, etc., are fully expounded by him; but in connection with them he has drawn

Herbart, J. F.,
1776-1841.

out a developed theory of the functions and processes of the soul. His theory of sense-perception may be briefly stated as follows:

The soul, though a simple substance, is capable of being excited by the action of various material stimuli to various reactions of its own. Certain classes of these, when experienced, are sensations. A sensation is the soul's reception of, or its reaction against the material stimulus. The sensations differ from one another in quality or kind on the one hand and in energy or intensity on the other.

As the several sensations are experienced, each continues to exist in the soul, with a force or tendency to reappear. As soon as the favoring conditions present themselves, past sensations do reappear in the order of the soul's original experience of them. When such a series is *viewed* [experienced?] from one sensation as fixed it is viewed in time; and by the mutual struggles or tendencies of several series of experienced sensations to gain possession a second time of the soul without success, the mind forms the idea of pure or simple time.

The apprehension of time prepares the body for that of space. Sensations experienced and recalled in the time series, are disputed by other sensations and series of sensations that struggle to occupy the soul. To provide for the possibility of these mutual struggles, and under the experience of the pressure which they create, the mind constructs a conception of space first as occupied, and then as empty or void.

Thus, time and space result to the mind as the effects of mutually blended or mutually repelling series of sensations.

When space and time are produced, that which is next developed is the apprehension of the difference between bodily affections and material objects. This results from an experience of certain positive sensations, particularly those of touch joined with those of the muscular sense. A certain portion of space within the body is measured in every direction by various time-series of sensations, terminated by those appropriate to superficial touch. Other sensations we project beyond the surface of the body, at greater or less distances, all of which are measured by successive time-series of sensations, in experience or imagination.

Sensations which do not occur within the space of the body, nor on its surface, as explained, are projected beyond—*i. e.*, are apprehended as not within its space. This constitutes perception in the lowest, or elementary degree. Afterwards are developed apperception, or the knowledge of mental states by a secondary act of knowledge; then the knowledge of substance and its attributes; then a knowledge of material things, or of material substances with material attributes and space-relations.

Herbart's theory of the sense-perceptions, though modified greatly by his metaphysical theory of real, or intelligible,—as contrasted with psychological—time and space, is yet, so far as the sense-perceptions are concerned, substantially the same with that of Condillac, and not far removed from that of Dr. Thomas Brown, of Edinburgh. His metaphysical theory, being closely allied to the monadic doctrines of Leibnitz, is not in the least inconsistent with the purely subjective character of the phenomena of sense-perception. This is only another example of the vain attempt to develop the perception of the objective out of the experience of the subjective, and to explain the apprehension of extension and the space dimensions by theories which suppose them to be known already.

§ 215. This gifted philosopher, theologian and scholar, deserves to be named for the very important contributions which he made to the theory of sense-perception. These were partly indirect, as he opposed so decidedly the current of the great leaders of metaphysical speculation in German, by rejecting many of the assumptions which are fundamental to their systems. In part, also, they were direct, in the positive doctrines which he taught in respect to the conditions and nature of sense-perception as a process. The relations of space, time, substance, and cause, he held, as against Kant, to be real forms of things, and not merely the forms of our apprehension of things. The reality of time and space must be assumed without misgiving or questionings. Being is directly apprehended, as well as phenomena and relations. To all the combinations and constructions which we make in knowledge, we attribute actual reality. Thought, which, in Hegel, is the all in all, the originator of all power and products of knowledge, according to Schleiermacher, is but a dependent attendant upon sense. In sense-perception there are two essential elements: the receptive, styled by Schleiermacher "*the organic function*," and the *a priori* spontaneous, called "*the intellectual function*." This last is an act of knowing by relations, or thought, and, as so defined, is an important improvement upon Kant and Reid, and even upon Hamilton.

Schleiermacher, moreover, teaches that the two elements, the organic and intellectual, are present in different proportions in the different faculties and acts of sense-perception, antcipating in this the law of Hamilton respecting the inverse proportion of sensation and perception proper. *Cf. Dialectik*, §§ 107-114, §§ 118, 119, §§ 122-131; *Psychologie*, (L. George,) pp. 76-133.

§ 216. The services of this eminent physiologist ought not to be overlooked. This distinguished man united in himself a complete mastery of physiology, the rare accompaniment of a just appreciation of psychological phenomena, and a competent acquaintance with speculative philosophy. In his analysis of the soul and of sense-perception, he assumes the reality of time and space. He sets in the clearest and most convincing light the truth, that the sensations are only varied forms of idiopathic affections of the several sense-nerves, which may be produced by any stimulus whatever, from within as well as without

Schleiermacher, 1768-1834.

John Müller, 1801-1858.

the body. These affections constitute the matter of sense-perceptions. This, in all cases, is apprehended by the mind in more or less definite relations of extension, as modifications of the bodily organism or the sensorium. It is because the sensorium is extended, that its affections, when it is excited to action, give us the knowledge of space-relations in material things. Even the visible universe is first seen in the retina, as a picture no larger than the extent of the retina itself. This is afterwards enlarged and projected by the mind. Hamilton was doubtless indebted to Müller for some of the most important suggestions toward his own theory. Cf. Müller, *Handbuch der Physiologie des Menschen*. II. v.; also the same, translated by William Baly, Lond., 1848.

Of the later, mostly living German writers, who have contributed to the theory of perception, we need name only: H. Lotze, *Medizinische Psychologie*, etc., Leipzig, 1868; *Mikrokosmos*, 3 Bde., Leipzig, 1856-1864; A. Trendelenburg, *Logische Untersuchungen*, Berlin, 1840. 1864; L. George, *Die fünf Sinne*, Berlin, 1846; *Psychologie*, Berlin, 1854; H. Ulrich, *Gott und die Natur*, Leipzig, 1862; *Gott und der Mensch*, Leipzig, 1866; L. H. Fichte, *Anthropologie*, Leipzig, 1856; *Psychologie*, Leipzig, 1864; W. Vorländer, *Grundlinien einer organischen Wissenschaft der menschlichen Seele*, Berlin, 1841; A. Helfferich, *Der Organismus der Wissenschaft*, etc., Leipzig, 1856; K. Forlage, *System der Psychologie*, Leipzig, 1855; W. F. Volkmann, *Grundriss der Psychologie*, Halle, 1856; Th. Walz, *Lehrbuch der Psychologie*, Braunschweig, 1849; M. I. Schleiden, *Zur Theorie des Erkenntnisses durch den Gesichtssinn*, Leipzig, 1861; G. Th. Fechner, *Elemente der Psychophysik*, Leipzig, 1860; W. Wundt, *Beiträge zur Theorie der Sinneswahrnehmung*, Leipzig, 1862; Fr. Überweg, *System der Logik*, etc., Bonn, 1857.

PART SECOND.

REPRESENTATION AND REPRESENTATIVE KNOWLEDGE.

CHAPTER I.

THE REPRESENTATIVE POWER DEFINED AND EXPLAINED.

REPRESENTATION is exercised after Presentation, and should be considered next; the higher power of thought requiring the development of both the other powers. The power to reproduce cannot be employed until something has been first produced which can be revived or recalled. There must be experience in sense-perception and consciousness before material objects or psychical states can be brought back again by memory or imagination. Presentation furnishes the material or matter for representation. Representation is indeed largely mixed with presentation. What we call our perceptions and acts of consciousness, consist very largely of remembrances and images. But although presentation is perfected by the aid of the representative power, it is before it in the order of psychological development.

Representation defined.

§ 217. Representation or the representative power may be defined in general, as the power to recall, represent, and reknow objects which have been previously known or experienced in the soul. More briefly, it is the power to represent objects previously presented to the mind. It is obvious that in every act of this power the objects of the mind's cognition are furnished by the mind itself, being produced or created a second time by the mind's own energy, and presented to the mind's own inspection. It follows that representation, in its very essence, involves a creative or self-active power.

Thus, I gaze upon a tree, a house, or a mountain. The object perceived is the tree, the house, or mountain, before my eyes. I close my eyes, and 'my mind makes pictures when my eyes are shut.' I at once represent or see with 'my mind's eye' that which I saw just before with the eyes of the body. One needs only to try the experiment upon the objects on which his eyes are now resting, to find an example of the exercise of the power of representation, and to mark the difference between its objects and those of sense.

*My eyes make pictures when they are shut.
I see a fountain, large and fair,
A willow, and a ruined hut. COLERIDGE.*

*My father—methinks I see my father!
Horatio.—Oh, where, my lord?
Hamlet.—In my mind's eye, Horatio. SHAKESPEARE.*

In like manner we hear a sound, either singly, as the solitary note of the pigeon, or several sounds in succession, as the *caw, caw*, of the crow, the roll of a drum, or the notes of

a musical air. Let the sounds cease. We can still distinctly recall them, and seem to hear them again with the mind, though the mind makes for itself all the sounds which it seem to hear.

In a similar way we can represent the percepts that are appropriate to the senses of touch, of tasting and of smell; reviving the touch, taste, and smell *by* and *for* the mind alone.

Music, when soft voices die,
Vibrates in the memory.
Odors, when sweet violets sicken,
Live within the sense they quicken.—SHAKESPEARE.

Not limited to
sensible objects.

We are not limited to sensible objects, or to sense-percepts, in the exercise of this power. We can as truly represent the acts and the affections of the soul itself. Not only can we with the mind's eye behold the tree and the mountain previously seen, but we can represent the act of the mind by which we beheld it, as also the delight which the sight occasioned. We not only hear a musical air the second time, but we revive again the idea of the accompanying pleasure. So it is with the relations in which the objects were presented at first. The objects themselves can not only be recalled as objects, but they can be recalled as related, or as totals made up of the objects as connected by the several relations under which they were originally known. Whether these are relations of space or time, of self or not-self; whether necessary and permanent, or casual and changing; whether intellectual or emotional—whether objective or subjective;—whatever we apprehend in presentation, can be recalled in representation.

Is also a creative
power.

But the activity of the mind in this general function is not limited to the power of representing objects previously present. It has another power over the objects of past experience. It can so far modify them as to transform them into new creations. It becomes in this way, in an eminent sense, a *creative* power. It can combine together pictures of sense and consciousness of which the parts have been given before, and on occasion of such materials it can evolve what are worthy to be called new creations. That the mind possesses this twofold power, all are conscious by the fact of exercising it. The mind not only can depict a man, a tree, or a mountain as actually witnessed, but it can alter the form, the dimensions, and the appendages or accidents of each, taking parts from the one and attaching them to parts belonging to the other. So, also, it can create or imagine a Lilliputian, a Centaur, a Parnassus, an Abdiel. The representative power in this higher form is called, as we shall see, the fancy or the imagination.

In the exercise of this power, of which these acts are examples, it is obvious that the mind is to be viewed subjectively and objectively. Subjectively viewed, it performs acts; objectively, it furnishes objects for its own subjective apprehension. These objects are furnished from its own previous acts, or the several objects appropriate to those acts; but when presented for the mind's inspection, they are objects to its apprehension.

Thus, if I recall a painting previously seen, my act in seeing it, my feelings or choices with respect to it—the whole, or any part of this complex activity, becomes an object to my present act.

§ 218. The power thus to act is called the representative, in distinction from, and in contrast with the presentative power

Appellations for the power.

In sense-perception and consciousness, the mind *presents* to itself for the first time the objects of its direct and original knowledge. In representation, it presents these objects a second time, or *represents* them.

It is also called reproduction, or the reproductive power, because the mind, by its own energy, under appropriate circumstances and in obedience to certain laws, reproduces objects previously known.

It also involves the power to *retain* and *conserve*, in a certain sense, that which has been acquired by the mind. To this capacity the name of *retention* has been given, or the *retentive* power. To these three distinguishable relations of the power, Hamilton has not only assigned separate appellations, but has treated them as separate faculties, viz., the conservative, reproductive, and representative faculties (*Met. Lec. xx.*). The activity of the mind in retention and reproduction is so entirely out of consciousness, and so little can in any way be traced or conjectured in respect to it, that it seems more philosophical to consider and treat retention and reproduction as the conditions of representation, rather than as distinct faculties. It is implied in the power to *represent*, that there is a power to *reproduce*; and in the power to *reproduce*, that the mind can *retain* or *conserve*.

We have already (§ 47) distinguished between the capacity of the soul to provide and present, so to speak, objects for the soul to inspect or know, and the power and act of the soul to know or apprehend them when presented. This capacity is observable in all the soul's knowing faculties, and in all the forms of its knowledge. But it is especially conspicuous and interesting in the representative faculty. The process of furnishing the objects for the soul's cognition is purely psychical. The material conditions are scarcely worthy to be considered. The laws under which the objects are retained and given up are spiritual. They are also very numerous, complicated, and interesting. It is owing to the circumstance that these processes are so peculiar and so necessary, that, by some writers—as Hamilton—a special faculty has been provided of retaining, and another of reproducing, and another of representing the objects of the mind's cognition and recognition.

It is also called the creative power, the constructive or productive imagination, when it evolves new products. This exercise of the representative power has rarely received a technical appellation.

The terms of common life and literature which are applied to the various forms of employing and applying representation are *conception*, *memory*, *recollection*, *reminiscence*, *fancy*, and *imagination*. But none of them are used in a precise signification, so far even as the common needs of men require. Much less will any admit of a technical or philosophical application. Thus *conception*, which is taken by Dugald Stewart to signify the representation—as act and object—of sense-per

Appellations in common use.

cepts, is, both in common life and in philosophy, used to denote objectively the concept, notion, or general conception, and subjectively the power to form the concept, etc. Again, it seems, like Locke's *idea*, to be the common appellation for any and every object of the mind's cognition. Fancy and imagination are used now in a narrow sense for special acts of the representative power, and again in the very widest applications of this term. No one of these terms is either popularly or technically used to designate the one power which, as conception, memory, fancy, and imagination, is exercised under common conditions and in conformity with common laws. Some technical term must be selected and employed, and none is more appropriate than representation, or the representative faculty.

This appellation, like many of those used in common life, gives prominence to the object with which the mind is occupied in knowing, rather than to the act of the mind in knowing it. It has already been stated, that the powers of the mind are better known and distinguished by the objects which they produce, than by the acts through which they produce them. It is natural, therefore, to name and define the powers as well as the acts of the mind *by or after the objects* through which they are most distinctly manifested.

§ 219. The *objects* of the representative power are, as has already been implied, mental objects. They are not real things or real percepts, but the mind's creations after real things. They are spiritual or psychical, not material entities, but in many cases they concern material beings, being psychical transcripts of them believed as real or conceived as possible. When they concern the soul only, they are not the real soul, or its present acts, but psychical transcripts of the real soul in a past or possible condition of action. They are in no sense *object-objects*, but are preëminently *subject-objects*. As *objects*, they are distinguished from the act of the mind which apprehends them: as *subject-objects*, they are created by that very mind, and exist only for that mind. As represented subject-objects, they always indicate another reality, whether spiritual or mental. The starry heavens which I see with the bodily eye, exist as a permanent occasion or object of vision, whether the eye is open or shut, whether it is attent or roving. But the starry heavens which I see with the eye of the mind, exist no longer than the beholding mind creates and upholds it in being. The mental experience which I recall is a real object while it is passing; the same state as recalled, is an object while it is recalled and confronted as having been a fact. But while this representative object is preëminently dependent on the mind for its being, it is yet clearly distinguished from the mind which regards it, and from the feelings with which it is known.

But though the object of the representative power is a mental object, it is an individual object. By this characteristic it is distinguished from a *thought-object*, or an object of the intelligence. Thought-objects are both mental objects and subject-objects, and, in an important sense, representative-objects; but they are generalized objects—they are universals. Objects of representation are like them in that they are purely mental objects, yet are unlike them in being individual. Whether we recall these objects, or create them—

Objects of the
representative
power.

Are individual
and not general.

whether we copy, as exactly as we can, from an original in nature, or create constructions the most fantastic, grotesque, or unnatural, they are all individual. Falstaff, Hamlet, Ivanhoe, Jeannie Deans, Don Quixote, Tam O'Shanter, the Eden of Milton, the Faëry Land of Spenser, are all individual beings in the imagination that originated, and the imagination that reconstructs them after their first originator.

In what sense
these objects are
the same.

When we speak of the same object as recalled or recreated—when we assert that the same individual object comes and goes, it will, of course, be understood that the same individual object exists only so long as the mind keeps it alive. When, then, the same object is said to be recalled a second time, it is not literally the same individual, but it is copied after the same original,—the same as revived or recreated, and capable, in this sense, of being recalled again and again, though perhaps in each case with individual deviations. For example, I look at a tree, and then close my eyes and picture it to my fancy. I do it again and again, reproducing what we call the same mental picture of the same tree. The picture is the same, so far as it is a true mental copy of the same original. But each picture is itself a fresh and new individual product, and therefore a separate individual object. The same is true of the mental pictures of what we call original creations of the fancy.

These objects in-
volve relations.

§ 220. The presented object was known by the mind not only as a being, but in its relations, as of diversity, space, time, etc.; so the object as represented, must or may be known again in all these relations, with all those in addition which are implied in its being represented. It has been abundantly established, that an object cannot be known unless the relations appropriate to its kind of knowledge are known also: so in represented knowledge we must be capable of recreating the objects in their original relations, as well as of recalling the so-called objects as such. It should be remembered, however, that a relation as such—i. e., a relation as separate from an object—as it cannot be apprehended by sense-perception or consciousness, so it cannot be recalled by representation. A relation, as such, cannot become an image or picture to the representative power (cf. § 424).

Relations pecu-
liar to represen-
tation itself.

The representative power, not only by the representative act recalls the object in the relations in which it was originally known, but the existence and exercise of this power involves relations that are peculiar to itself. Thus, in recalling a tree or a horse previously perceived, or a mental act of knowledge or state of feeling, I not only bring back the tree or horse as extended and external, and the psychical state as subjective and in time, but, in recalling it, I must know it as a *subject-object*, and as *having been previously perceived or experienced by myself*. These relations are both necessary and peculiar to the representative power. The notice of them here is but an illustration of the principle that in knowledge of every kind the apprehension of some relations is essential, and that every mode of knowledge has its special relations.

No technical name for the objects of this power.

For the objects of this power we have no appropriate technical name. The exigencies of common life do not require such a term, and the nicer distinctions and the special applications of philosophy have not been established long and precisely enough to lead to the formation or the appropriation of any term with a precise and technical significance. The words *image* and *picture* might be properly applied to the represented percepts of vision; but to speak of the image of a sound, smell, or touch, would be incongruous, if not offensive. Still less tolerable would it be to speak of the image—i. e., the revived impress of an act of knowledge or feeling. *Conception* cannot be accepted, as was proposed by Stewart, for it is too frequently applied to other and very different objects. *Idea* would be more significant, if it could be forced back to its original and etymological import; but idea has, since the time of Locke, been compelled to do all manner of service, and been literally compelled to signify “whatever the mind can be occupied about in thinking”—thinking being held equivalent to every species of mental activity (cf. Locke, *Essay*, B. ii. c. viii. § 8). In the earlier days of the English language the representative power was called *imagination*, or *phantasy*, and then *images* and *phantasms* were appropriately and literally applied to its objects. But if it is impossible as yet to find a term like *image* to which we can attach a precise and literal signification, it should ever be remembered that the objects of this power are individual objects, as distinguished from the concepts, or notions, of thought. But, though individual, they are purely mental entities; yet while they are beings of the mind, they are, as objects, contrasted with and distinguished from the mind that creates and beholds them.

Conditions and laws of representation considered.

§ 221. The *conditions and laws* of the representing power should next be considered. The mind, in representation, as in the exercise of all its powers, acts under limitations and according to laws. That it can perform certain operations and evolve certain products, is to be explained only by asserting that it is endowed with, or finds itself possessed of a capacity to act in this or that manner, and to originate the appropriate products or results. Thus the mind finds itself, so to speak, actually perceiving, remembering, imagining, and reasoning.

From the fact that it possesses and exercises a power, it does not follow, however, that it is exempt from the limiting constraint of conditions, and the regulating force of laws.

In representation, man does not, like the great Originator, create by his fiat or from nothing, his world of mental objects. It is only from the elements or the suggestions of past presentations that he can construct any representations at all. What he reproduces or constructs anew, is in some way dependent upon what he has previously experienced. But more than this is true. Not only must every thing which is represented be reproduced from or by means of some past experience, but what is represented at any moment depends upon what was present the instant before.

Thus: I see a person whom I have previously seen, at a place well remembered, under circumstances of peculiar interest. The sight of this person brings back, as we say, the image of each of the persons present, one after the other, of the words spoken, of the events which occurred, etc., etc., till the mind has wandered through a series of pictures, drawn from the acquisitions of the past. Each new scene opens new objects, from one to another of which the mind is carried forward by a force and tendency of which it is not aware, till on a sudden it

awakes, comes to itself, and is surprised that it has wandered so far from its starting-place—wonders how it came to its present position, from which it vainly strives to thread its way backward.

In such a succession of connected and dependent representations, we observe not only that one act is dependent upon another, but that they are connected by definite and distinguishable relations. In one case the present object that suggests the object represented, is a material thing; at another it is a mental affection; at another it is an object represented only, which brings up another representation,—image suggesting image, one after another.

These objects are connected, now by having been perceived or experienced together in making parts of a contiguous scene, now by having followed one another in the original presentation; now, one presentation or image is like another; or a presentation resembles an image and the converse; or perhaps one was the cause, or the effect, or the reason, or the inference of the other. The fact that one object or image brings up another to the mind, is called the *association of ideas*. The conditions or laws under which the mind recalls one object by means of another, are usually called the laws of association. The term is open to exception, because both percepts and experiences are connected with images, as truly as images [or ideas] with images. The phrase is, however, too firmly established in general acceptance and use to be set aside.

The conditions or laws under which the mind recalls one object by means of another, are called the laws of association. The consideration of these laws is a prominent and interesting topic in the discussion of the representative faculty.

§ 222. The representative power, though marked by common characteristics and obeying common laws, is divided into several *varieties* or species. These are separated from one another by the completeness or incompleteness of the pictures which they make of the objects once presented; by the fidelity with which they adhere to, or the liberty with which they deviate from their originals; by the laws of association which predominate in each variety, and by the ends for which the power is exercised, and the uses to which it is applied.

The most perfect exemplification of the exercise of the representative power is an act of *perfect memory*. In order to know what an act of perfect memory is, we need only reflect upon the essential constituents of a presentative act, as already explained. Such an act is always complex, involving the object, the action, and the agent, united by their mutual relations into one indivisible state. If the object is material, it involves certain relations of space; the action, being one of a continuous series, involves relations of time; the agent, being of body and soul united, must exist in every act under relations of both space and time. When a single act of presentative knowledge is recalled in all these elements of object and relation, the representation is complete, and the act is an act of perfect memory. For example, yesterday I took

Representa-
tion divided
into several
varieties.

Perfect memory.

a walk to the top of a neighboring eminence. To-day I recall distinctly the landscape which I saw, in its minutest features—re-creating, as I do, a distinct and vivid picture of the scene; and not only of the scene, but of myself as beholding it, with the actions before and after, with my feelings also in viewing it, and the very accidents of place where I sat or stood during the view. This is an act of perfect memory. It is perfect or complete, because it includes every element of the original.

As time goes on, it is possible that one or other of these elements should be recalled far less distinctly, or should be omitted altogether. It is possible that I should be able to bring back the landscape only as an object, and be certain, as I see or think of it, only that I once saw it before; but how or when, or with what feelings or from what point, I do not recall. Or possibly the object may be lost, and the subjective feelings may alone be revived and recognized as having been before experienced. Relations of time and accessories of place may both be lost. Thus, when I see the face of a person in a crowd, I know that I have seen it before; but when, or where, or with what feelings, I cannot recall. I remember a familiar passage of prose or poetry; I know that I have read or heard it; but when, or with what feelings or attendant circumstances, I cannot tell. All these are acts of what may be called *imperfect memory*. The representation is incomplete in some of its elements. Much of our acquired knowledge is retained and recalled by such acts of memory.

Memory is not only distinguished into varieties by the greater or less completeness with which it recalls the past, but also by the class of associations under which these objects are represented. According to this criterion, we have the memory of space and the memory of time, the spontaneous and the philosophical, the ready and the retentive, the natural and the artificial memory.

But memory, whether perfect or imperfect, is clearly distinguishable from *phantasy*, or the imaging power. This is representation without the recognition that the objects recalled have ever been perceived or experienced before. Examples of this are such as the following: I look distinctly at the front of a dwelling, the form of a horse, or the outline of a tree, each of which I wish to retain and make wholly my own. I close my eyes and picture each distinctly to my mind. The undivided force of my attention is expended upon the object, and so successfully, that it becomes a permanent possession as an object, without any accessories of either place or time. I may have travelled, and furnished myself with abundant pictures of beautiful objects in nature or art—of rivers, lakes, mountains, or wide expanses seen from lofty heights; or I may be absent from home, and the homestead, the accustomed apartments, the grounds, the garden, the beloved faces, haunt me with their presence. In all cases of disturbed fancy,

Imperfect memory.

Phantasy.

often called *phantasy*, visions of objects seen before, but not remembered or recognized, throng in upon the soul. Especially if rapturous joy, poignant sorrow or harrowing remorse, have left ineffaceable impressions of scenes and persons beloved, hated, or feared, will these images re-present themselves without bidding. There may be no recognition, no knowledge that the object is familiar or has been seen or felt before. These acts are acts of imaging, called by Dugald Stewart, acts of simple conception. They are more likely to occur in those conditions of the soul in which the action of the reason is nearly suspended, or permanently set aside, as in reverie, dreaming, monomania, and partial or complete insanity.

Imagination; its varieties.

But the mind can do more than simply represent the past with greater or less perfection, with or without the act of recognition. It can recombine or construct anew the materials which the past furnishes for it to work with or upon. In such acts it becomes imagination. Of imagination, as thus defined, there are several forms or varieties.

The mathematical imagination.

1. The mind may neglect or leave out of view all things existing in space, and all events occurring in time, and form to itself pictures of void space, and of time more or less extended or limited. Within these voids it can make, by its own constructive energy, geometrical figures, and arrange series of numbered objects, and thus provide for itself the materials of mathematical science. This is the *mathematical imagination*.

Phantasy proper.

2. It can separate and unite the parts and attributes of objects and existences, both spiritual and material, in divisions and combinations which never actually occur. These separations and unions may be effected for no high end either of reason or improvement, in obedience only to the more obvious and the lower laws of association. Thus, the chimney of a house can be set upon the hump of a camel, and the ears or head of a donkey upon the body of a man. Or horses may be colored red or yellow. This is *phantasy proper*, whose effects or products are simply *grotesques*, or, as we say, *fantastic*.

Poetic fancy.

3. Objects may be recalled in wholes or in parts, and recombined and reconstructed under the obvious and more natural laws of association, in forms attractive to the feelings and approved by taste, for the ends of wit, humor, or amusement. This is *fancy proper*, which, as exemplified in literature and some of the fine arts, may be distinguished from the higher imagination.

Poetic imagination, in the higher sense.

4. When the higher objects of nature and spirit are recalled, recombined, and created, with the aid of the nobler laws of association, for the higher ends of ideal elevation and improvement—when, in addition, the better feelings are addressed and excited, and the higher capacities of man are called into action, then the

power becomes poetic imagination. The sphere of this power is not poetry alone, but eloquence, music, painting, sculpture, architecture, and landscape gardening; inasmuch as all afford opportunities for the expression and excitement of the sentiments and suggestions which dignify this noble form of the representative power. This is *imagination* as contrasted with *fancy*.

5. When the combinations and creations are effected for the purposes of research, invention, and instruction, and under laws of association which are grounded on scientific or thought-relations, we have the special application of the representative power which is called the *philosophic imagination*.

The philosophic and the poetic imagination may be limited to special services of ethical improvement and religious incitement, and constitute an important element in ethical ideality and religious faith.

§ 228. The *interest* and the *importance* of the representative power is enforced by the following considerations:

1. First of all, the exercise of this power ministers pleasure of a high order and in great variety, which is independent of the accidents of fortune and circumstances. The soul, from childhood to old age, delights in the pictures of its own creating, whether these are copied with simple fidelity from the beings and events of actual experience, or are painted for mere delight in the wantonness of fancy. Besides the interest derived from the objects created, it finds a satisfaction of the highest order in the very act of creating. Whether these acts are exercised by the infant in its endless combinations of play and sport, or the simple story which it rudely and painfully groups together of two or three incidents, or whether it is employed by the novelist or poet who constructs the highly-wrought fiction on which he lavishes all the resources of his knowledge and his skill, the pleasure of creating is the same.

2. Man often flees to the unreal world of the fancy, to find rest and relief from the highly wrought excitement of the too earnest and engrossing real world. Hence, in day-dreaming or reverie, he enjoys simple relaxation and not wholly inactive repose. Often the fancy gives more than relief and rest—it ministers positive solace and comfort. Ideal objects furnish associations more pleasing and emotions more satisfying than any which the experience of reality can awaken. The sick man forgets for a brief moment his actual weariness and pain, in the scenes of health and action which he imagines. The prisoner is enlarged from his cell. The oppressed forgets his wrong. The homeless dwells under the shelter of a roof which is his own. The hunted exile, or the disgraced outlaw, returns to his country, loved and longed for.

3. This power is the necessary condition of all the higher functions of the intellect, and, in fact, of every description of intellectual achievement, development, and progress. The thought is almost too obvious to express, that memory is the servant of thought and the conservator of our acquisitions; that, without the record of facts, principles could neither be formed nor used. It was not by an idle fancy that *Mnemosyne* was said by the ancients to be the mother of the Muses. Were the mind limited to the objects and the activities of the present, it could make little progress of any kind. Thought would be almost impossible. Generalization, by which many objects are viewed as one, would be restricted to the few present objects that could be brought within the range of a single act of comparison. When the act was finished, it would be lost forever. It could never be reapplied to a new object, or be enlarged in its sphere. The new individual objects of sense and of consciousness would

also be isolated. They could not even be named, for each would stand apart in the loneliness of its own individuality. Language would be impossible.

The induction of principles and of laws would be excluded, for, however nearly the mind might infer that a common law controlled the objects perceived at a single gaze, neither the objects nor the principles learned through them, could present themselves a second time, the one to be exemplified or the other to be explained. There could be neither invention nor discovery. Even in mathematical science both would be impossible; for it is only as the mind imagines new constructions in space and new combinations in number, or their symbols, that it can develop new theorems or solve new problems. Creations of art would be excluded; for the constructive brain of the painter and sculptor must go before or with the hand that guides the pencil and directs the chisel. The inventor in mechanics, the composer in poetry or music, the thinker in morals, philosophy, and letters, the deviser of beneficent schemes for human well-being, are each and all dependent on the resources of the imagination for every possible conjunction of cause and effect, of tendency and result, out of which to find what it seeks or to effect what it desires.

We may say, indeed, that the representative power in the double activity of the memory and imagination are as indispensable to the higher intellect, as are the senses and the consciousness which furnish the material for it to work upon. The one gives this in the original form; the other revives it with new freshness and in a more plastic condition. No more manifest or more serious error can be committed, than for the philosopher to decry the imagination as injurious to, or inconsistent with, eminent scientific activity and achievement. Without the ministry and service of this subtle and ready agent, the thinking power can have only the scantiest material to work upon. According to its activity and its wealth are the reach and opportunity of the higher intellect.

The practical uses of the imagination are not to be overlooked. It creates ideals of what we might be and do, which are far higher and nobler than any thing which we are or which we perform. It lifts us above ourselves and the examples we observe in real life, furnishing nobler standards to which we may aspire. It constructs images of a better existence and of a better society than our residence on earth can furnish. It makes to us attractive suggestions of that Unseen Being, to whose goodness and greatness the highest and brightest of our imaginings can give us only feeble and faint approximations. A pure and elevated imagination is in many ways allied to a noble ethical nature, and favors an ardent and a sustained religious faith. If the representative power is so varied in its functions, and so important in its influence and uses, it may reasonably attract our attention if we would truly know ourselves.

CHAPTER II.

THE REPRESENTATIVE OBJECT—ITS NATURE AND IMPORTANCE.

Our general view of the representative power has furnished us with three leading topics:

The objects or products of representation, the conditions or laws of its activity, and the varieties of representation as determined jointly by these different objects and laws. We begin with a particular consideration of the first of these—*The object in representation.*

Why the object of representation needs special discussion.

§ 224. The product of the representative power, or the object which the mind creates and apprehends in memory and imagination, has been the occasion of much confusion of

thought, and not a little controversy. Scarcely any single topic has been more vexed in ancient or mediæval philosophy, than the nature of ideas or representative images. As the term *idea* in the English language is applied to the widest possible range of objects, so these controversies either include or trench upon almost every possible question in metaphysical philosophy, beginning with the images or species, material or quasi-material, that were supposed to be given off from every object perceived; and ending with those eternal ideas which Plato and his followers held to be the archetypes of all created beings, and which they even hypostatized into actual and almost divine agents. These controversies and questions respect ideas of perception, of memory, of imagination, and of thought—ideas *a posteriori*, or ideas of experience, and ideas *a priori*, or ideas that are original and necessary. But to all these the ideas of the memory and imagination have a very close relation, and hence a just determination of their real nature will go very far toward an accurate understanding and a satisfactory solution of the questions and controversies which concern the remainder. In respect to this class of *representative ideas*, three topics or heads of inquiry present themselves: I. *The nature and mode of existence of the object which the mind remembers and imagines.* II. *Its relation to the original, from which it is derived and to which it is referred.* III. *The special service which it renders in thought and action.*

I. *The nature and mode of existence of the representative object.*

§ 225. These objects or products, as has already been stated
They are psychical objects. (§ 221), are psychical existences. They exist in and for the soul only. They are at once the products of the mind which brings them into being, and objects for that same mind to cognize or contemplate. Whether they are transcribed from real beings and real acts, or whether they are created out of the materials or upon the suggestions which real objects furnish, makes no difference with the nature of the objects themselves. These are purely psychical and spiritual. It makes no difference whether the original is material, or spiritual; the idea or image of each and of both is simply a psychical object.

In any state or energy of representation there is distinguishable *the act* and *the object*. These two can be *distinguished*, but not *divided*. When I represent the sun, or the stars by night, or my own act or feelings when I beheld them, the mental object which I contemplate is severed in thought from the mental act by which I think of them. They cannot be severed in *time* or in *fact*. We cannot by one mental effort, create the object and hold it in waiting for a second effort by which the mind turns upon it its apprehensive gaze. The two concur together. The one element is given and is present with the other. The creation of the object, and the mind's inspection of it, are as one.

We do not here bring into view that concealed and subtle activity by means of which the mind retains or is moved to recall the object. This activity and this influence is out of consciousness, and is to be sharply distinguished from those elements which consciousness discriminates and records. It is with these only that for the present we have to do.

It is a transient and short-lived object.

§ 226. The mental object is as transient and evanescent as the act by which it is brought into being. In this respect the mental object is strikingly contrasted with objects that are real. The acts by which we know both psychical and actual objects, are for a moment. They die as soon as they are born. They cease to be at the instant in which they begin. But it is not so with these two contrasted objects. The real object alone is fixed and permanent. To it we can come and from it we can go, and find it still the same. But the psychical transcript or creation is as shortlived and evanescent as the act by which we behold it.

They should be distinguished from spectra and hallucinations.

§ 227. The psychical objects of the representative power are to be carefully distinguished from those *spectra* or *hallucinations* which are the result of an abnormal or morbid condition of the sensorium or the nervous organism. The one are psychical, the other are psycho-physical. The one are spiritual in their nature, the other are dependent upon the soul as connected with the sensorium.

Hallucinations, or spectra, are intimately related to those subjective sensations which, as we have seen, are caused by any excitement of the sensorium by means of subjective agencies as distinguished from material objects (cf. § 342). In certain conditions of the human system, the sensorium is capable of being so excited—sometimes by psychical and sometimes by physical agencies, and sometimes by both conjoined—as to give to the mind objects taken to be sense-perceptions, but which have no actual existence (cf. § 342). These are not properly representative images or ideas, which are purely psychical creations and objects, being created by a psychical power under psychical conditions, and having only a psychical existence. This psychical activity and these psychical laws hold intimate relations to the sensorium and the psycho-physiological activity; but the action and the products of the two are clearly distinguishable, and should not be confounded.

These representative objects are not only psychical, but they are intellectual objects. They are intellectual objects. It has been held by some that memory and imagination when they recall past psychical experiences of feeling and of will recall the experiences themselves, and not our ideas of them. (a.) "It is not ideas, notions, cognitions only, but feelings and conations, which are held fast, and which can, therefore, be again awakened." "Memory does not belong alone to the cognitive faculties, but the law extends in like manner over all the three primary classes of the mental phenomena" (*Ham. Met. Lec. xxx.*). This opinion of H. SCHMID is apparently sanctioned by HAMILTON. It is a logical inference from one of the doctrines which he seems to advance concerning consciousness. But if consciousness is an act of knowledge, and knowledge, when matured, gives, as its products, intellectual objects which we can recall; then, as when we feel we know that we feel, so, when we remember that we have felt, we remember our past feeling as an object known—i. e., we recall our idea of it (§ 75). Whatever this image or idea may be, it is not the feeling actually recalled as a real feeling, any more than the mental picture of the mountain which I remember, is an actual mountain. The feeling remembered, if pleasant, gives me pleasure; but it is because I remember the object which occasioned the first pleasure, as well as the pleasure which it occasioned, that I experience this new emotion. The pleasure which I enjoy is not the original pleasure revived, but a fresh pleasure from the object recalled by the intellect, and perhaps a reflex pleasure from the fact that it is revived. But whatever it be which excites the pleasure, whether the exciting object or the pleasure

excited, it is the object, or the pleasure *as remembered*—that is, as an intellectual object—which is apprehended by the mind. The representative object is not only a *psychica*, but it is also an *intellectual* object.

II. *The relation of the representative idea to its original.*

The relation can be compared with no other.

§ 228. The represented object holds a positive and close relation to the real or original presented object, which is *sui generis*, and can neither be resolved into, nor explained by any other. We say that the one is taken from or is suggested by the other; that the one is true or false to the other; that the one is known or recalled by the other; that the one is like or unlike the other. What precisely the relation is which these phrases describe, it is not so easy to determine. It is important at least to distinguish it from those relations with which it is often confounded, and thus to clear away the many errors into which philosophy has often been betrayed.

Two classes of representative objects.

For convenience, we distinguish the objects of representation into two classes. The first includes those which are copied or transcribed from originals in nature—the objects that appear in recognition or memory. The second includes all those which imagination, in any of its forms, modifies or constructs from the materials or suggestions which nature furnishes.

We begin with the first—with representations transcribed from nature; i. e., with the mental objects that are acquired by perception and consciousness—which are employed in recognition or are conserved in memory. In respect to all of these, we inquire, What relation do they hold to their originals?

Representative ideas of consciousness and sense-perception do not resemble their objects.

§ 229. In answer to this question, we observe: (1.) That the ideas which we acquire by consciousness or perception do not properly resemble them, either as parts to parts or as wholes to wholes. Neither the single features nor the combined wholes of any mental transcripts can by any possibility resemble or be like the single features or united wholes of any material or spiritual being or act. A mental object is wholly incapable of being confronted or compared with an existing reality. One material thing can be like another material thing as a whole and as a part. So can one spiritual being, or a single spiritual act, be like another spiritual being or act. One tree can be like another tree, as a whole, or in one or more features, as in size, in form, in color, in fruit, in effects. One mental state can be like another, as one affection of hope or fear, of joy or sorrow. One act of perception can be like another act, in its occasions or attendant circumstances, or in its subjective quality. But the mental image of a tree cannot be like a tree, nor can the mental remembrance of a mental experience resemble or be like the original act or state.

It is true, one of these may be loosely and vaguely said to resemble or be like the other; but that this language is only employed in the way of analogy, is evident from the contradictions and absurdities into which those philosophers have involved themselves who have understood it literally.

We have seen (§ 201) to what contradictory and impossible conclusions Locke's definition of knowledge, as the discernment of a conformity or resemblance of ideas with their objects, exposed himself, and actually conducted Berkeley and Hume. This definition, literally construed, would, on the one hand, make the knowledge of real existences impossible, by placing the real object forever beyond the reach of the mind, if the mind could attain it only by means of the mental ideas between which and the original it could institute a comparison and discern a resemblance; or, on the other, it would make such a discernment of resemblance superfluous, by requiring that the mind should first know the original, in order to compare it with the transcript. To say that, in order to know, we must discern that our ideas resemble realities, is to assume that we already do or do not know the original. If we already know these original realities, we do not need to inquire whether the representative idea resembles it. If we do not know the original, we never can acquire this knowledge by finding a resemblance between it and its mental transcript; because, to discern resemblance, it is requisite that we should first have known the objects which we are required to compare.

Many of the theories of representative-perception rest on the mistaken assumption, that what the mind first and directly perceives, must be some mental idea or transcript, and that it reaches the original or material reality only as it discerns a likeness or resemblance between the one and the other. The question would then continually be interposed, 'How a thought-object can be like a thing? what resemblance is there between a mental picture and a material reality?' To relieve this difficulty, third entities were interposed, partaking somewhat of the nature of the two—something material that was attenuated almost to spirit, or something spiritual that was hardened almost into matter—a *sensible species*, a so-called *material idea*, or *phantasm*, which was conceived to have points of likeness with each of the two extremes of matter and spirit and served to establish the possibility of resemblance between them.

In memory and recognition, no discernment of resemblance. None in simple memory.

§ 230. We observe still further, that when we remember or recognize objects which we have previously known, we do not discern any proper resemblance between the original and its mental transcript. For example, we look upon an object, as a house, a tree, a portrait, the page of a book; or we hear a sound, we perform some mental act, or experience some feeling; and when the object is removed, we recall it in our memory. It were simply absurd to say that we recall the material object by its mental object, or that we remember the object by its likeness to the mental picture which we revive to our minds. A discerned resemblance supposes two objects between which the likeness is seen; but in an act of simple memory it is plain that only one object is before the mind. It is therefore clearly impossible that any resemblance should be discerned; inasmuch as two objects are necessarily required. In recalling or remembering a past object, event, or mental experience, we simply picture it as having been before discerned or experienced in fact, and we do this by a direct act of the mind. This peculiarity in an act of simple memory was without doubt what Reid intended to notice and to emphasize in his assertion, which Hamilton criticises so often, that in "memory we have an immediate knowledge of the past."

None in recognition.

When we recognize a real object by a second or subsequent act of knowledge, we do not discern a resemblance between the object and its mental picture. In such a case we are

said to recall the picture which we have preserved, and to compare it anew with the original, and in this way to recognize the object as like the picture, or the picture as true to the object. This is said with some plausibility or verisimilitude; for it may and often does happen that we turn from the real object to the mental picture, and again from the mental picture back to the real object, till at last we are satisfied that the object is the same, that our recollection of it is correct, and our recognition of it is well-founded. But in all such cases there are not two objects before the mind, viz., the mental picture and the original; and of course no resemblance can be discerned between the two. The mind has to do with but a single object—now with the original, and then with the transcript. It reverts from the one to the other, but it does not properly compare the two, nor discern a likeness between them.

When we discern likeness or resemblance, we compare two objects together that are homogeneous, as two colors or two forms. But we cannot compare a real object and its mental transcript, by bringing them together in juxtaposition or in immediate succession. We cannot compare them by juxtaposition, for that would require that the mind should think of the same object as real and mental at the same instant. We cannot compare them in immediate succession, for this would require that we first know the image to belong to the object, before we compare it with the object, to discern whether the two are alike. That is, we must first remember or recognize, in order to compare and see resemblance; while the theory requires that we first compare and discern likeness in order that we may remember and recognize.

But if the relation between these objects is not a relation of resemblance, what is it? For that some relation is discerned between them, is obvious from the experience of all men, and from the tenacious uniformity with which it is described as a relation of resemblance. We reply:

The acts of memory and recognition known by consciousness only.

The relation of the mental transcript to the original can only be understood by considering the acts of mind by which we acquire and recall them. The maxim has been more than once repeated, that the nature of mental products can only be understood by the mental acts which give them birth. To understand the relation of a transcript to its original, we must consider the nature of the act by which we acquire it, as related to the act by which we recall and revive the same.

Alternation of perception, memory, and recognition.

To bring these acts together, in order to compare them, let them be employed alternately upon the same object. Let the eye be fixed upon some object, as of a landscape, or a human face, and then be alternately opened and shut.

In other words, let the eye of the body and the eye of the mind be occupied upon the same material picture and its mental transcript. In the act of perception I see the real landscape, or face, in its relations of extension, form, and color. In the act of representation, I seem in phantasy to see the same landscape, its extended surface, the several parts, their relation, form, and size, their lights and shades, and distributed color. It is pictured or imaged as real, but it is known not to be real. It is known to be created by and to exist in the mind. Both these acts are known to be real, and so are their products. One is known to depend on the other, in act and object; the second, in its object, to be a mental

repetition of the first. In the second, we say we seem to recreate so far as we can by the mind, the real or material object of the first. The capacity to create a mental transcript of a real thing is involved in the very power to remember. Each of these acts is original and *sui generis*; and the relation of the one act to the other is as original as are the acts themselves. This relation cannot be compared to the resemblance between two objects of perception or two states of consciousness; between two colors, or two forms, or two feelings, or two thoughts.

As the eye opens and shuts upon the landscape seen and the landscape imaged, the real landscape is alternately remembered and cognized. When the eye is shut, it is remembered as *having been seen*. When it is recognized, it is recognized as *the same which we saw before*, and which we had remembered during the interval; but in neither case is any resemblance discerned. It is involved in the act of memory, that an object perceived should be recreated by the mind and recalled as real, and also that, when the object is perceived, it should be recognized as the same which was remembered as mental. Moreover, there is also involved the knowledge that the object, as perceived and recognized, is real—either spiritual or mental—and that the object as remembered, was mental only.

When it is said that the mental image is transcribed from the original, or represents it, the language describes an act and objects which are in one sense *sui generis*, and incomparable with any others. The nature of the product or object is determined by the mind's capacity to originate it; and the authority of the mind to trust it and accept the objects which its own activities involve, is to be found in the fact that it finds itself, so to speak, spontaneously exercising the power. Concerning this peculiar object and relation we affirm *positively*.

Mental pictures less exciting than real objects. § 231. (1) The mental picture affects the sensibilities less powerfully than the perception or experience of the reality. By the supposition, if the original be a sense or material object, it must move or excite the senses, and this class of feelings are in their essential nature absorbing and vivid. If the experience be of a mental act or state, no recollection or transcript can match the reality in its power to interest and excite the soul.

Different persons differ greatly in the power vividly to reproduce and make real the past, and as greatly in the capacity to be moved by it in their sensibilities. Some persons cannot revive a scene of pleasure or pain without ecstasy or horror; the very picture or remembrance of any thing which they have enjoyed or suffered seems to revive much of the delight or pain which the original experience occasioned. But even the sensibility of such persons to the present and the real is usually in direct ratio to their susceptibility to the pictures which their memory revives. That the real object excites more feeling than the same object remembered, is assented to by common experience and confirmed by universal testimony.

*Signus irriliant animos demissa per aurem
Quam quæ sunt oculis subjecta Adelibus, et quæ
Ipse sibi tradit spectator.*—HOR. De Art. Poet.

O, who can hold a fire in his hand,
By thinking on the frosty Caucasus!
Or cloy the hungry edge of appetite,
By bare imagination of a feast!—SHAKESPEARE, *Rich. II.*

Sometimes, indeed, it happens that a recollected object excites stronger feeling than the object when directly cognized. Thus, a scene of suffering may be witnessed with little emotion, which cannot be revived in thought without shuddering. Thus, friends and opportunities are valued far less when we have them, than when we think of them after they are

gone. This comes from the circumstance that, when the object was present, we failed to attend to or rightly estimate its value or its real character. Memory corrects our careless observation or our mistaken judgments, and so opens our sensibilities to more vivid emotions.

A mental picture consists of fewer elements than a real object.

§ 232. (2) The mental picture consists of fewer elements than the original. It is but a scanty outline, as contrasted with its fulness—a skeleton, as compared with its roundness and life. We look at a real tree, and in the background there is the confused or vague perception of the undistinguished mass of form and color, while from it is projected in bold relief a few prominent parts, that attract and hold the attention. The mental picture of the same, when most successfully taken by the best observer, and after the most attentive inspection, is but a meagre transcript of a few of those details which the attention caught; while of the multitude that were only confusedly apprehended, scarcely can a trace of one, here and there, be recalled. If we test by the reality the best picture that we can frame in the fancy, we are surprised at the poverty of the one and the richness of the other.

The mental picture is recalled in parts, slowly, and by successive acts.

§ 233. (3) The mental picture is recalled in parts under the laws by which one suggests another, and is constructed with comparative slowness. The reality displays its wealth of detail as coëxistent, to a single view. Or, if we study its details with attentive analysis (§ 187), we do this with inconceivable rapidity, under the guidance and suggestion of the object itself. The object, when re-created in memory, is re-created in the several parts of which it is composed: if a material object, in the several sense-percepts which make it a thing or whole. If it is extended in space, or manifold or irregular in outline, the parts of the surface and outline must be recovered one by one, under the laws of association, and by acts that are successive to one another in time. This fact has led many psychologists to reason that our ideas and notions of space and space-objects can be resolved into and originally consist of relations and notions of time.

Example from a scene in nature, as seen and remembered.

To illustrate these contrasted features, we need select but a single example. It is a precipice up which we gaze. First it impresses us as a whole, diversified by its varied features. Here are the broad faces of perpendicular or impending rock. These are buttressed by slopes strewn with accumulated fragments. Here and there are bushy crags and scattered boulders. The whole cuts against the sky with a notched outline, fringed here and there with nodding herbage, or broken by some daring tree, that, stayed upon its uncertain footing, reaches out and up toward heaven. If all this is apprehended by sense-perception, the quick eye first surveys the whole with a rapid sweep, then runs hither and thither, as it is caught and led by some salient feature, the rock itself bringing out new material faster than the mind can appropriate it, impressing the feelings with new emotions of wonder the longer we strive to master its wealth.

Let us seek to image that rock in the mind, at evening, when we are just returned from a fresh gaze upon its front. In place of the exhaustless confusion of the vaguely-seen whole to guide and excite the eye, there slowly presents itself the scanty framework of the few parts which can be recalled by the mind. These parts are recovered one by one, as the mind rests upon what is already present, and brings back in fragments, and by repeated efforts, that which

it suggests. However exciting the effort to recall and to reconstruct, and however pleasing the picture that is recalled, yet the impressiveness and exciting power of the reality are wholly wanting.

Objects of imagination. The objects which the imagination in any way combines and creates do not differ greatly from those which the memory transcribes, in their relation to the real existences of matter or spirit. The only material difference between the two can be expressed in a word—the one represents real, the other possible existences; the originals of the one in fact exist, and have in fact been perceived or experienced; realities corresponding to the other might exist. In every other respect the two classes of objects coincide.

When we say, 'Might exist,' so far as the perception or consciousness are concerned, we do not assert that they might be believed or supposed to exist in consistency with the known agencies and laws of nature in matter and spirit, but that the relations involved in the direct experiences of the facts of nature would allow them really to exist and to occur.

How greatly and in how many particulars imagined objects may be varied from the originals of nature, and what are the limits within which the imagination can use its power to create and combine, will be considered hereafter. P. II. c. v.

III. *The usefulness of ideas in thought and action.*

In thought, we prefer ideas to realities. § 234. The special service of the products of the representative power for thought and action remain to be considered. It has already been observed (§§ 52, 170), that the process of perception, or consciousness, is normal and complete when it results in an idea or image—i. e., when a transcript of the individual object is prepared for future recall. The usefulness of these acquired facts and of these imagined possibilities of nature will be accepted by every one. Their absolute indispensableness to secure the past, and to give range and reach to invention, is obvious to every mind. But it is not clearly, certainly it is not generally acknowledged, that, for the purposes of thought, remembrances are often better than percepts, and that the pale and scanty images which the mind creates are often superior to the fresh experiences which life presents. We often even prefer to employ mental images, when we might avail ourselves of actual observations. Very often we take fresh observations for the sole purpose of giving accuracy and assuredness to our ideas or mental representations. Often, when we seem to ourselves and others, to generalize or reason about things observed and experienced, we reason not about the things, but about our ideas of them. We often turn the fact into a mental picture or recollection, even while our eyes, our ears, or our attent consciousness seem to be occupied with a present reality.

The idea presents fewer features than the reality. The reason is, that the image, provided it be correct, presents to the mind fewer elements than the reality, and therefore does not distract, but aids the attention in the activities of thought. Moreover, the elements which it includes are

usually the very elements or features with which thought concerns itself. For this reason recollection often guides thinking, and aids it in its work.

When we change our perceptions into *ideas*, or *ideate* our intuitions, we retain only what we attend to; hence the image presents *fewer points* or elements than the original. We are likely to attend to what is most important, especially if we bring to our observations an eye instructed by the previous training of thought, or the experiences of scientific inquiry. A mind that is disciplined will of necessity direct the observations of things to those features with which thought is concerned; and these points will remain recorded in the memory for thought to classify, or be recombined in the imagination, for thought to invent and to explain.

In a certain sense, representation *abstracts* while it revives; as it omits much of what it perceives or feels, and retains only what it cares for.

When the mind proceeds to compare, to classify, to reason, and to account for, it can work more readily with these *abstracts* from things than with the things themselves; because the attention is not disturbed by the feelings and desires which realities are likely to awaken; because unimportant and trivial individual features do not suggest accidental and distracting relations, and because, also, the ideas of things can be summoned more rapidly and crowded more closely, and of course compared more readily, than the same number of things. In so simple an act as to compare twenty apples, in respect to any general feature, the imagination or memory helps the eye. When we seem to look upon the objects, we ponder upon their images. Hence, in observations of things which are accompanied with any comparative analysis or judgment, we close and open the senses by alternate acts. We close the sense, that we may with undistracted thought think or judge of the image which it gives. We open and use it again, that we may correct or fix the image by or upon which we think.

*Ideas especially
useful in com-
parison.*

§ 235. When the range of objects is wider than any actual observations of sense or consciousness, when most of the objects to be compared and judged in thought, are removed

from any direct inspection of present activity or experience, it is obvious that the materials on which we work must be images chiefly. When we compare the flower or the mineral which we see with those which we have seen in places and times that are remote, we first *ideate* the flower or mineral before us, in order that it may be susceptible of comparison with those which are known only as images. Things can only be compared with things, images with images; things must therefore be converted into or viewed as images, before they can be compared with what are images already.

In higher generalizations, still fewer elements are required.

As the mind widens its range of materials for thought, and rises to higher generalizations, its images of things will need to consist of still fewer features—viz., those only which it needs to use in classification or reasoning. So far as it brings before its view concrete realities or individual examples, these need only contain those parts or elements which come into use in generalization, induction, or argument. The plastic power of representation here comes into

play, which can readily omit all that it is not necessary to consider and can easily supply every thing that illustration or discovery may need.

§ 236. Representation can go so far in its abstractions as to leave but a meagre outline, a mere skeleton of a concrete thing, or group of things. Such a skeleton has been called a *schema*. Such a *schema* or outline-image has been held not only to be the necessary condition for the formation and use of concepts, but it has been also contended that it is like the concept, in being general, and equally applicable to every individual thing to which the concept is applicable. For example, when we speak or think of such general terms or notions as *horse*, *dog*, or *flower*, it is urged that the mind frames a *schema*, or outline-image of the form or other relations of each, which is equally suitable to every individual horse, dog, or flower. This *schema*, it is urged, differs from the concept in that it is not divided or severed into constituent elements, each one of which is regarded as an attribute of a substance, but it remains as an extremely abstracted whole, which may be applied to every individual horse, dog, or flower. This view contradicts the doctrine which we have laid down, that the object in representation is always individual, and never general. It is true, as is asserted, that we usually connect some image with a general concept. We cannot easily use general terms, without picturing or illustrating them to the imagination (cf. § 424). But the image of a horse or dog need not be general, because it is very scanty or meagre in its features. Suppose it to be merely the outline of a horse's form; suppose it to be furnished with a horse's ears, or mane, or tail; so far as it is imaged, it must be individual. The reason why it seems to be general, is, that it is so readily changed when it is brought into contact with a real horse. Being a creation of the imagination, it can be changed by addition or omission, so as to conform to the horse before us. Or, if no real horse is perceived, the individual image with which we exemplify the concept is known in all the features with which we endow it, to stand for every real horse which we chance to perceive, or which we choose to imagine. It is more correct to say that the *schema* is representative rather than general. It is capable of being readily compared with every object of its class, and hence its preëminent utility. Kant, *Krit. d. r. Vernunft u. Prok.*; Schleiermacher, *Dialektik*, § 262; Vorländer, *Grundlinien*, pp. 390-392; A. Helfferich, *Organismus der Wissenschaft*, p. 97.

The nature of the outline image, or *schema*, and its relation to the concept, will be still further considered under the concept. (§ 424.)

We observe, at this point, that it is more than a mere conceit or fancy to say, that, as we rise from perception to thought, we interpose the image or idea as an intermediate stage, being less gross and entangling than matter, and yet more substantial, definite, and concrete than thought. The image directs and aids the concept, standing, as it does, midway between it and the percept. On the other hand, the idea, especially when directed by thought, reacts upon perception itself, making it more intelligent and productive, as it directs the senses to what features it should attend, and often anticipates what it will find. In this way aimless efforts are spared, fruitless voyages of discovery are avoided, and the energies of the mind are expended upon productive objects.

§ 237. Not only do images assist in perception and thought, but they prepare for and prompt to action. If we recall an object which formerly moved us to excited feeling and impelled us to prompt and energetic action, the thought of the same object is fitted to excite us again in a similar manner, in real or mimic activity, in body and in soul. To the human being who has been trained as body and spirit in the experiences of life, thought, feeling, and bodily action severally suggest one another in ready and inevitable succession, and the

The nature and service of the *schema*.

Images prepare for and aid to action.

one element prompts and prepares the way for the other. If an action is yet to be performed—if we are to sling a stone, or point a rifle, or throw a quoit, the image of the act and object held before the mind brings all the muscles into position, and makes ready for the act required the instant the act is called for. Hence, in the discipline for feats of bodily dexterity, a vivid and concentrated fancy, a strong and kindling imagination, are of essential service, as they bring the powers into that position which effective activity requires. The same is true of discipline to mental exertion, so far as any purely spiritual activity depends on the distinct conception of an object. The thought of an enemy to be assailed, or of a wrong to be avenged, knits the muscles, braces the limbs, and convulses the features. The savage stamps with rage or shouts with exultation at the pictures which his fancy paints of his foe or his friend. The cultivated idealist is convulsed with horror at the pictures which his imagination draws of the scenes of cruelty which he reads of or conceives. He acts over again, in fancy, the part which he himself is ready to take in the depicted scene. So intense and vivid are his conceptions, that he breaks out in audible words of execration or rebuke, or stamps his feet with indignation, or raises his hands in horror.

When men are to act in concert; as to row, or pull, or shout in unison, or to repel an assault, or to storm a battery, or in any way to use their united strength, their imagination must be brought into active service in anticipating beforehand the objects which will soon present themselves, or the kind of activities in which they are to engage. The ideal is far better than the real scene for the purposes of discipline and anticipation. The picture is greatly to be preferred before the reality. The real object may distract and bewilder as well as arouse and hold the attention. It may over-excite, and so unman. It may bring up unexpected objects, as well as those which are looked and hoped for. The reality, as compared with the idea, may hinder action, as it hinders thought. While, then, the idea cannot take the place of the reality, and discipline, by means of the idea, is of little avail unless it actually prepares for action, it is essential to such preparation. Nature has provided for this discipline by the strong impulse which she awakens toward it: she secures great deeds by first awakening grand pictures in the excited fancy.

CHAPTER III.

THE CONDITIONS AND LAWS OF REPRESENTATION—THE ASSOCIATION OF IDEAS.

WE have noticed already that the soul, in representation, as in all its acts or functions, is limited to fixed conditions, and acts according to established laws. Though, at first, it seems to evoke its objects from the non-existing and the unreal, on a second and a nearer view, it is clear from our conscious experience, that what is represented is immediately dependent on the object or objects which at the instant previous were present to its

apprehension or experience. What is recalled at any moment, though recalled by the soul's proper activity, is always recalled by means of the cognitions and feelings which the soul possessed the moment previous.

Association of
Ideas. General
fact. Various
terms.

§ 238. The general fact or truth that ideas are represented by means of ideas now present, is usually designated under the general title or phrase of '*the association of ideas.*' A more careful consideration of the principle or law under which the representation of the past by the present is conceived to be possible and known as actual, leads to the investigation of what are called the *laws of association.*

The term *suggestion* has, by some writers, been preferred to *association.* They prefer to say, one idea suggests another idea, rather than, one idea is associated with another. This preference is partly a matter of taste in words, and in part is grounded on the philosophical theory which one of these terms is supposed to designate better than the other.

Some object to the phrase, The suggestion or association of *ideas*, because ideas are not the only objects or elements that are concerned; real or existing objects or phenomena being as truly capable of exciting representations as the ideas or remembrances of things. Indeed, objects or acts perceived are usually more efficient than objects remembered or imagined, to bring up associated images or thoughts. It will be seen, on a nearer view, that this criticism is more specious than well-grounded. Besides, the phrase is too well established in general use to be easily set aside, even though the reasons for so doing were vastly stronger than they are found to be in fact.

Importance and
interest of the
subject.

§ 239. To seek to determine what are the conditions and laws of representation, is to propose an inquiry to which we are impelled by the intrinsic interest and even mystery with which the power itself and its actings are invested to all thoughtful minds. To answer this inquiry by certain definite principles—so far as such principles can be fixed—is an essential prerequisite to an enlightened theory of each of the special forms of this power; as the memory, the fancy, and the imagination, in all their varieties. All these so-called powers of the soul are, as has been explained, but special forms of the general power mentally to represent the actual past. They must all depend upon common conditions, and obey common laws. A just and well-founded theory of the association of ideas is a necessary prerequisite to a satisfactory theory of all these several powers. Representations are also always employed in the actings of the other leading powers, viz., sense-perception and thought; and for this reason the consideration of the laws which regulate their presence or absence is essential to a complete elucidation of the powers with which, at first, they seem to have little concern.

Hamilton observes (*Met., Lec. xxxi.*), that "the scholastic psychologists seem to have regarded the succession in the train of thought, or, as they called it, the excitation of *the species*, with peculiar wonder, as one of the most inscrutable mysteries of Nature." "The younger Scaliger says: 'My father declared that of the causes of three things in particular

he was wholly ignorant—of the interval of fevers, of the ebb and flow of the sea, and of reminiscence.’” “The excitation of species is declared by Poncius ‘to be one of the most difficult secrets of Nature’ (*ex difficilioribus natura arcanis*); and Oviedo, a Jesuit schoolman, says, ‘Therein lies the very greatest mystery of all philosophy’ (*maximum totius philosophia sacramentum*).” Viewed in one aspect, this impression of mystery and the wonder which it excites are not at all surprising. Thoughts and images come and go with the apparent caprice and lawlessness of wizards and fairies—now obtruding themselves where they are not wanted, and then hiding themselves most provokingly, notwithstanding the most earnest desires and the loudest calls for their return.

Association used to explain all other facts and laws.

On the other hand, when the movements of representation are explained, this explanation is taken to explain almost every thing beside; so largely do the coming and going of represented objects enter into the other phenomena of the soul. A very considerable number of psychologists, as we have already remarked, have accordingly resolved all the psychical powers into the operation of the laws of association—viz., reasoning, induction, the belief in causality and adaptation, and even in time and space. Some have even resolved the conception of the soul itself, and of its several faculties, into the accumulation of associated and blended impressions of individual objects. The association of ideas has played a most conspicuous rôle in the modern theories of the soul and its operations, and its influence upon such theories was perhaps never so great as at present. Next to false or inadequate theories of sense-perception, have incorrect theories of the association of ideas exercised the most mischievous influence upon the scientific views of the soul, and indirectly on philosophical, ethical, and theological truth (cf. § 43). It becomes, therefore, a matter of the most serious consequence to attain correct conceptions of the laws of the representative power.

Method of discussion and inquiry.

§ 240. To do this with success, it is necessary, as in similar cases, to state at some length the defective or erroneous theories which have been accepted to explain these operations and laws. This will enable us to pronounce a critical judgment upon their error, as well as to recognize the truth which they include, and will prepare us to develop a true and satisfactory theory.

It will be observed, that the laws of association pertain to what Hamilton calls the reproductive, as distinguished from the representative power; in other words, to those operations of the soul which prepare objects for the soul’s apprehension, as distinguished from the soul’s act in cognizing them when prepared and presented (§ 47). In representation in all its forms, this function must necessarily be very prominent and important. In representation, the soul prepares and furnishes its own objects of cognition. The capacity to do this, and the laws under which the operation is performed, are analogous to the psycho-physiological capacities and acts of the soul by which sense-objects are prepared for the soul’s sense-perceptions.

The laws of association have been divided into two leading classes, the *primary* and *secondary*, which again may be distinguished as *general* and *special*. They are distinguished thus: the primary or general are those which act or tend to act at all times and in all persons, while the secondary and special are those which determine the associations of the same or different individuals at different times.

The theories which we shall notice apply to both of these classes, though more eminently to the primary. We begin with

I. *The primary laws of association.*

Association not explained by bodily organisation.

§ 241. We observe, (1.) that the theory is untenable which asserts that the representative power has a special bodily organ or instrument, and that its phenomena are explicable by the mechanical or physiological laws which are appropriate to such an organ.

It has been held by not a few writers, among whom Bonnet was conspicuous, that the brain, or nervous system, is such an organ. As what we know in sense-perception was thought to be or to depend upon certain vibrations, undulations, or oscillations of the brain and nerves, so it was held that the objects thus apprehended for the first time can be re-presented to the imagination or the memory, whenever these same oscillations or vibrations are resumed or repeated. A tendency to this recurrence or resumption is induced by their having been previously presumed in perception. Others maintained that every act of perception effects a permanent condition or disposition of certain of these fibres, which is resumed again in representation. Some held that, in addition to the oscillating fibres of the brain, there is also present a very delicate and sensitive fluid, which is another agency intermediate between the brain and the soul. Those who held that the soul is immaterial, insisted that the brain and nervous system are simply its organ in representation, on the action of which the mind is as completely dependent for its images and remembrances in representation, as for its objects in perception it depends on the organs of sense. Still greater plausibility was sought for this theory by the attempt made by some to show that the soul itself has a special seat or organ in the brain, by the sympathy of which with the vibrations of the remaining portions all the phenomena were resolved.

We have already explained sufficiently how earnestly the cerebralists and associationalists of recent times reassert the same views, and seek to enforce them by the aid of the results of modern physiology.

La faculté par laquelle les représentations s'opèrent, est l'imagination. Mais les idées sont attachées aux mouvements des fibres sensibles. Pour qu'une idée se présente de nouveau à l'âme il faut donc, que les fibres appropriées à cette idée soient mues de nouveau. La disposition du cerveau à répéter ces mouvements constitue donc l'imagination. Bonnet, *Essai de Psych.*, § 213. Cf. *Essai Analytique sur les Facultés de l'Âme.* Cf. D. Hartley, *Observations on Man: his Frame, his Duty, and his Expectations.* 3 vols. London, 1791; A. Tucker, *The Light of Nature Pursued.* 4 vols. Cambridge, U. S., 1831; J. Priestly, *Disquisitions relating to Matter and Spirit.* London, 1771; A. Bain, *The Senses and the Intellect.* London, 1855.

The logical consequences of this theory would be, that the soul, for the presence of represented objects, is entirely dependent on the service and agency rendered by this material organ, and that if it has any activity or freedom, this can be used only in detaining the objects that are presented, by retaining the organ or its parts in those positions of vibration which would be necessary to keep the objects before its view. Many of the adherents of these views do not assert for the soul any such activity, but resolve all its phenomena into the presence of those objects and states which the varying condition of this organ, in accordance with mechanical laws, might seem to require.

In view of the theory that the senses and the imagination were thus dependent upon the sensorium, &c., the brain and nervous system, these powers were formerly ascribed to the lower or inferior energy, which was called the animal soul, or the soul in contrast with the spirit or higher and rational soul, to which the higher and more spiritual functions were allotted.

In modern times, since the various sensible qualities have been resolved into modes of motion, and many physiologists and some psychologists have resolved the capacities of the sensorium for different sensations into a simple susceptibility for slower or more rapid vibrations, there has been a renewed disposition to make the representative power to depend on revived vibrations of the nervous energy. Such theories, have, however, been usually carried out to the bald materialism with which they have a strong affinity.

Dr. J. P. Jæsen (*Versuch e. wissenschaftl. Begründung d. Psychologie.* Berlin, 1835), accepting the physiological theory which finds in the cerebellum the organ of the phenomena of sense and motion, has

made an elaborate attempt to show that the cerebellum must be the organ of the imagination also, by means of the impressions made upon it through the sense-perceptions; while the cerebrum, as the organ of the reason, uses the cerebellum, so to speak, as the sensory of the imagination.

Defect of all
physiological
and corporeal
theories.

§ 242. All these theories fail to be supported, by reason of a common defect. The structure of the brain and nervous system in no way indicates that they are capable of the vibrations or oscillations which are postulated of them. This structure is not entirely fibrous. What seem to be fibres, are not capable of the tension and relaxation which more rapid and forcible vibrations, or those which are slower and feebler, would require. They are not sufficiently numerous to answer to the myriads of millions of states of thought and feeling which are represented in memory and the fancy. No particular change of the kind alleged has ever been known to occur in connection with a represented object. We call the eye and the ear organs of sight and hearing, because, with the observed conditions and the varying states of these organs, sensations are present or absent, or vary both in quality and in force; but never has an undulation of the animal spirits been observed, or even conjectured, to which might be referred the remembered face of an absent friend, or the vivid picture of a once-visited scene. No presumed vibration of any set of fibres or nerves has ever been observed to be connected with any picture or remembrance whatever. No nerve-cell has been known to be formed in connection with a picture fixed in the memory, or a purpose decisively taken. Again, the theory, if complete and adequate in every other particular, would fail entirely to account for the creative energy of the imagination. Representations of this sort are very abundant, and often very vivid and forcible; but how some of these fantastic and gorgeous scenes could be provided for by any disposition of fibres or vibrations of the nerves, it is impossible to see. The theory was evidently evoked as a necessary consequence and complement of a similar theory devised to account for the agency of the brain and nerves in the sense-perceptions. If that theory is untenable, this must, *à fortiori*, be rejected. It must be conceded however that

Facts relating to
the connection
of the body with
the imagination
and memory.

Certain conditions of the body are connected with a far more intense activity of the representative power than accompanies others. In other bodily states this activity is excessive, irregular, and even uncontrollable. Experience and observation both testify that this power, in all its forms, whether of memory, phantasy, or imagination, both in sleep and wakefulness, is modified very greatly by the organization and temporary condition of the body.

When the body is in health and in a normal condition, *memory* both acquires and gives up its treasures with the ease and exactness of instinct; and *imagination* combines and creates, as if by the spell of an enchanter, so skilfully as to be herself surprised at her own work. Under the excitement of delirium, the elevation of enthusiasm, or the brief madness of passion, the power to recall and create seems almost to be used by another self; now mocking the

vain efforts of the man to control the rush of his too affluent fancy, and now suggesting for his service or his delight unexpected stores of facts and fancies. It is in vain, at times, that the soul essays to retard or to still the throng of unwelcome images that break in upon it like a succession of stormy waves. In sleeplessness induced by an elation of the nervous system, the rational soul seems to be separated from the imagination, and to become the passive spectator of the strangest caprices. We are wearied to exhaustion by the force and persistence with which these fancies at once bewilder and overmaster us. In delirium, the fancy seems to have completely overmastered the rational soul, paralyzed its functions, or frightened it from asserting its rightful supremacy.

How these facts
can be accounted
for and explain-
ed.

§ 243. These phenomena can be accounted for by two considerations: First, there is the general truth, that the soul is dependent for the measure of force which it has at command, on the force and normal activity of the powers which maintain the corporeal life. When the bodily force is weakened, the force of the mind is often weakened in all its functions—of sense, representation, and thought. This general fact may itself be inexplicable, but, being assumed to be true, it may explain some of the cases in which the memory and imagination are weakened by disease, or are nearly suspended in faintness and some of the forms of sleep.

Any disturbance
of the bodily
state introduces
disturbance in
sensations.

Second, a disturbance of the functions and activities of the body is attended with an unequal action of the powers of the soul. This can in part be accounted for by the obtrusive influence of the sensations and other mental experiences which are the consequence of this unequal bodily action. The soul seems to have at its command, in any given condition, only a certain *quantum* of attention, or psychical energy, which may be evenly distributed among the various activities of which it is capable—as sense, consciousness, representation, and thought; or, if concentrated into one, it is thereby withdrawn from and incapable of the rest. It has already been noticed, that we cannot exert the utmost energy in hearing and seeing at the same instant; still less can we perceive and imagine or reason, at the same instant and with the highest energy and effect. At one time the body, in health and in its normal state, is, as we say, the ready servant of the soul; in other words, all the sensations are so agreeable or so gentle as to be unnoticed, and the whole attention can be given to other than animal or sensuous experiences. In other conditions, as in extreme hunger or active pain, the sensations are so absorbing as to exclude all energetic spiritual activities, whether of thought or feeling. In still other conditions, the generally dormant vital and muscular sensations may be so positively obtrusive as to withdraw or depress the soul's capacity to fix the attention upon any other objects with steadiness and effect.

The vital sen-
sations, though
vague, may be
links in a chain
of associations.

§ 244. And yet these muscular or vital sense-perceptions, though obtrusive and unpleasant as sensations, may be so vague and indefinite, as *perceptions*, as to serve chiefly as the

suggestors—under the laws of mental association—of other images. We ought never to forget that, in all conditions of our existence, so long as we exist as soul and body, these vague sensations of which the body in all its parts is the occasion, form the constant background on which are projected the more definite and distinctly remembered of our experiences. To parts of this background, or to the whole blended as a single perception, the more positive experiences may be attached under the laws of mental association. In every moment of psychical act or suffering, whether painful or pleasant, whether presentation, representation, or thought, this complex of undefined sensations must be present as a constant accompaniment, and of course as a more or less important element. When these sensations become more than usually active, through an excited or a diseased condition of the body, they can suggest every image with which they have been connected in the past; and by themselves and through the objects which they suggest, preoccupy the whole force of the soul's activity. The condition of the body may thus affect the whole activity of the soul, by simply introducing unusual *psychical* experiences, which operate according to purely psychical laws, both in absorbing the attention from the rational functions, and in obtruding a throng of associated images.

These considerations will, it is thought, explain many cases of the singular and almost capricious dependence of the memory upon the varying conditions of the body.

The laws of association cannot be referred to any attractive power in ideas as such.

§ 245. (2.) The laws according to which ideas are represented to the mind cannot be resolved into any attractive force—as is conceived by many—in the ideas themselves, by which they suggest or revive one another. This theory differs

from the one just discussed, in making the ideas, as psychical agents, to exert a force and attractive tendency similar to that which was ascribed to the brain or its physiological functions.

Many of the explanations given of the phenomena of association, and much of the language in which they are expressed, are fitted to leave the impression that ideas attract one another somewhat as two drops of water tend to run together, or two globules of quicksilver rush into one; or as if, when the larger drop or globule is divided in whole or in part, the second portion draws the other after itself. Whether or not the authors of these explanations and of this language would admit such a construction of them, it is certain that the doctrine of association and its laws has been presented in such a form as to justify this construction, and to make it necessary to guard against it.

Thus Hobbes writes: "All fancies [phantasms] are notions within us, relics of those made in the sense; and those notions that immediately succeeded one another in the sense continue also together after sense; in so much as the former, coming again to take place, and be predominant, the latter followeth, by coherence of the matter moved, in such manner as water upon a plane table is drawn which way any one part of it is guided by the finger." (*Lev. p. i. ch. iii*; cf. *Hum. Nat.*, ch. iii. § 2; and *Eleme. Phil.*, ch. xxv

§ 2. Of the ancient philosophers, Carneades compared the suggestion of thoughts "to a chain, in which one link is dependent on another." Themistius, as translated by Hamilton, says: "For as in a chain, is one link be moved, the link therewith connected will of necessity be moved, and through that the next again, and so forth, this likewise is the case in those impressions of which the soul is the subject." Johannes Major, according to Hamilton, says: "*Una notitia trahit alteram, ut sela rutoris flum.*" Locke says: "Some of our ideas have a natural correspondence and connection one with another: . . . Ideas that in themselves are not at all of kin, come to be so united in some men's minds that 'tis very hard to separate them; they always keep in company, and the one no sooner at any time comes into the understanding, but its associate appears with it, and if they are more than two which are thus united, the whole gang always inseparable, show themselves together." (*Essay*, B. ii. c. xxxiii. § 5). Hume says: "These are, therefore, the principles of union or cohesion among our simple ideas, and in the imagination supply the place of that inseparable connection by which they are united in our memory. Here is a kind of *attraction*, which in the mental world will be found to have as extraordinary effects as in the natural, and to show itself in as many end as various forms. Its effects are everywhere conspicuous; but as to its causes, they are mostly unknown, and must be resolved into *original* qualities of human nature, which I pretend not to explain." *Hum. Nat.*, B. I. p. i. Sec. iv.) James Mill (*Analysis of the Human Mind*, chap. iii.), says: "When two or more ideas have been often repeated together, and the association has become very strong, they sometimes spring up in such close combination as not to be distinguishable. Some cases of sensation are analogous. For example: when a wheel, on the seven parts of which the seven prismatic colors are respectively painted, is made to revolve rapidly, it appears not of seven colors, but of one uniform color—white. By the rapidity of the succession the several sensations cease to be distinguishable; they run, as it were, together, and a new sensation, compounded of all the seven, but apparently a single one, is the result. Ideas, also, which have been so often conjoined, that whenever one exists in the mind the others immediately exist along with it, seem to run into one another—to coalesce, as it were, and out of many to form one idea; which idea, however, in reality complex, appears to be no less simple than any of those of which it is compounded," etc., etc. The whole passage is accepted by J. Stuart Mill, in his *Exam. of Sir William Hamilton's Philosophy*, ch. xiv., with marvellous *naïveté*, as though it were an almost original exposition of the subject. The doctrine of "*inseparable associations*," thus enounced, is with him not only an *axiom*, but the axiom, which is the '*open sesame*' of all metaphysical and psychological problems.

Herbart's Theory of the attraction of Ideas.

The most consistent and thorough-going advocate of this theory of the attractive force of ideas, as ideas, either in ancient or modern times, is Herbart (of § 43). All the mental phenomena, and even the several powers of the mind, he accounts for by the actions and reactions of the mind's ideas. Ideas are strengthened when they recur often enough to gather the force which blends them into one or arranges them in a permanent series. After being experienced, they remain in a condition of constant tension, ready on the slightest occasion to rush back into the possession or rather the *presence* of the soul; and again pressing hard to return as soon as a kindred object of perception or representation shall attract them back. The relations of the ideas to one another, both static and dynamic, are expressed by Herbart in mathematical formulæ, for the purpose of bringing psychology into scientific relations with physics, which, in his view, tends to confirm the theory, that the attractive and repellent force exists between ideas as such, and not in the action of the soul of which they are simply states or energies.

This theory is open to similar critical objections with the one which follows, with which it is intimately allied. We observe next, that

Nor into the force of relations as such.

§ 246. (3.) The conditions and laws of representation cannot be referred solely, or even primarily, to the force of certain *classes of relations* which exist between ideas. This theory is, in its principle, not superior to the literal or figurative ascription of attractive force to the ideas themselves.

These relations variously classed.

Aristotle enumerates three of these relations which constitute the laws of representation, viz.: *Contiguity in time and space, resemblance, and contrariety* (*De Mem. et Rem.*, c. ii. § viii.). Hume asserts the three laws of association to be *resemblance, contiguity in time and place, and cause and effect*. Others increase this number to seven, viz.: *Coexistence or consecution in time; contiguity in space; dependence as cause and effect, means and end, whole and part; resemblance or contrast; produced by the same power or conversant about the same object; signified and signifying; designated by the same sound*

Others contract them to two: *Simultaneity* and *affinity*. St. Augustine, and very many others, have reduced them to the single law of *redintegration*, or the formula that 'a part of a mental state tends to bring back and restore all the parts which originally composed it.'

All these laws are founded in truth. All the formulæ which enounce them describe facts of consciousness. Whether they fully exhaust the subject, and bring us to the ultimate principle or law of the mind's activity, must be reserved for further inquiry.

Examples can easily be adduced of the representation of ideas under all of these relations. We begin with those of *place*. When I recall a single building upon a familiar street, I think at once of the building adjoining, and so on, of each that is next. When a portion or feature of a landscape is recalled, as a part of the falls of Niagara, or a single peak of the White Mountains, the entire scene comes back to the view of the mind, either as a whole or in its several parts.

Contiguity of time is illustrated by the following: When a single event is thought of, which occurred upon some day of my life made memorable by joy or sorrow, that event suggests the others which occurred in connection with itself—either before or after—till the whole history of the day has passed in review before the eye of the mind. Words call up the sentences in which they have been heard or read; phrases bring back sentences; sentences, a part or the whole of a discourse. A note of music suggests the snatch of melody in which it has been heard; this suggests the air, till the whole tune is repeated to the ear of the mind.

Objects that were successive in time, may also have been contiguous in place; as when the parts of an imposing procession were seen in succession, passing beneath the same arch, or entering the same edifice. In such a case the relations of time and place connect these objects, and by means of them both these objects may be recalled in order.

Inasmuch as all objects adjacent in space must, if perceived with attention, be originally perceived by acts successive to one another in time, it may and generally will happen that when they are recalled as contiguous, they may also be recalled as successively perceived, and thus both the relations of *time* and *place* may act conjointly. Thus, if I examine the interior of a large public hall or church, I may walk around it on my feet, drawing near to every part which I inspect; or, standing in one place, I may survey every object by successive applications of the eye. But these objects are also contiguous in place, and form together a whole of space. As such, they may be grasped by the eye at a single view—so much of the interior as the eye can survey—the whole and the parts together. When the whole "rises like an exhalation" before the recreating eye of

the fancy, it may be by the aid of one or both of these relations. Indeed, it might be urged that all objects adjacent in space, whether viewed by a single or by successive acts of attention, must be also connected under the relations of coëxistence or of succession in time, and the relation of time must be always present and controlling.

Relations of similarity and contrast. The relations of *similarity* and of *contrast* serve to recall objects. If I see a house like the one in which I lived when a child—it is of no consequence when or where—it causes me to think of my early home. If I see a face that resembles the face of a dear but absent friend, it brings that friend to mind. If a man sees a horse like one which he formerly owned, or a lady sees a dress which in material or color is like one which she has worn, the horse or dress are instantly recalled. The likeness may be of the whole to the whole, or of a part to a part; as of a house to a house, a mountain to a mountain, a tree to a tree, a face to a face, in general outline or expression; or again, as of a door or roof (the part of a house) to a door or roof; or of a single feature in the face to another feature.

So, objects that are unlike, especially such as are strikingly contrasted, recall one another. Cold makes us think of heat, light reminds us of darkness, joy of sorrow and sorrow of joy, sweet of bitter and bitter of sweet.

Relations of cause and effect. The relation of *cause* and *effect* is constantly recognized in our experience. The cause may recall the effect, or the effect the cause. Fire makes me think of heat, and ice of cold. The wound under which I suffer, recalls the blow which caused it. The gift which I enjoy, brings to mind the kindness of the giver. The treachery of Arnold suggests the death of Major André. The heroic devotion of Florence Nightingale brings to view the relief and comfort of sick and wounded soldiers; then is suggested their gratitude, and then the admiration which her example has commanded, and the imitation to which it has prompted.

Of means and ends, etc. Under cause and effect, and dependent upon it, is the relation of *means* and *ends*. Any instrument or contrivance suggests the use for which it was devised. Thus, a fire-engine makes us think of a conflagration; a locomotive, of the drawing of a railway train; a thumbscrew, or a case of surgical instruments, of torture or amputation. The thought of an end suggests the possible or necessary means. If a weight is to be raised, or a building is to be moved, we think of a lever, or a combination of screws and rollers. If we are in difficulty or danger, the mind is occupied exclusively with all the possible methods of extrication or deliverance. When our energies are quickened by fear, necessity, or hope, there rush to our thoughts every conceivable expedient of which we have ever heard or read.

These *three* or *four* relations are the laws of associations which are

more commonly recognized. To these, three other laws have been added, which have been already named. Operations or objects of the same power or faculty, suggest one another, and the faculty concerned. The sign suggests the thing signified, and the thing signified the sign. Objects accidentally denoted by the same sound are associated. A little attention will convince any one that these may find their place either under the law of cause and effect, or under the very comprehensive relation of contiguity of space and time.

Are not other relations sup-possible?

The attempt to increase the number of the relations that are conceived to operate as laws of association and conditions of representation, most naturally suggests the inquiry, whether there is any special charm in the three or four relations of resemblance, contrast, contiguity of space and time, and causation, which invests these alone with efficacy in the recovery of ideas. We ask at once, Why may not any other relations serve as well as these? Why, of the two objects that are connected by any relations whatever, may not each suggest its correlate? We find, in point of fact, that this is so—that objects connected by many special relations, as of *premise* and *conclusion*, *evidence* and *inference*, do recall each other. We discover, moreover, that the objects related as mutually causes and effects must be contemplated as such, in order that they may suggest one another. In other words, they must have been connected in the mind as causes and effects, that it may be possible for one to recall the other. If they have not been thus known, or cannot readily be thus known, the one is impotent to recall the other. For example, oxygen suggests the rusting of iron, or the increase of combustion, or the purification of the blood, to the mind that has known that the one is a cause and the other is an effect; but to one ignorant of these relations of oxygen, it would have no such suggesting power.

Cannot these relations be reduced to a single law?

This fact leads us at once to the inquiry whether the power of one related object to recall another object is not derived entirely from the circumstance that the two have been connected by the mind's previous activity? In other words, it suggests the theory that the conditions and laws of representation do

not depend upon the attractive force of the objects or ideas themselves, nor upon the power of relations as relations in a smaller or greater number, but upon the subjective energy of the mind in uniting them, or upon the single circumstance that the mind has bound them together by some previous activity of its own.

The law of redintegration.

§ 247. (4). Philosophers have united all these relations under what they have called the *law of redintegration*, which is thus announced: Objects that have been previously united

as parts of a single mental state, tend to recall or suggest one another. Redintegration, as here used, is equivalent to the complete restoration of the whole, on condition of the presence of one or more of its parts. This law was announced by St. Augustine, by Wolf, by Malebranche, by J. G. E. Maas, and is accepted with some qualification by Sir William Hamilton.

Will this explain all these particular cases?

It is an interesting and much-vexed question, whether this law will meet and explain all the special cases of representation. If we concede that the three or four laws or relations enumerated by Hume and others cover and comprehend every supposable instance of recall, and attempt to resolve them all into

the law of redintegration, we shall find the following results:

The relations of time, space, and causation.

(a.) Objects contiguous in time present no difficulty. Indeed, the law of redintegration might be viewed as only another expression for the law that objects conjoined in time tend to restore or suggest one another, inasmuch as the parts and the whole respectively must have been united as contiguous in time.

(b.) Objects adjacent in space, as has already been observed, usually come under the relation and law of contiguity in time, and are therefore easily accommodated to the law of redintegration.

It is to be observed, that a whole and parts in time directly, and in time indirectly through space, are given in the same instantaneous act, or by a succession immediately consequent. That successive objects in time are capable of being bound up as wholes, is obvious from experience. When we so learn as to recall the successive words which make a sentence, we either maintain an apprehension of the constitutive relation which they all have to the whole, while we are hearing or reading each part, or we bind them into a whole by a single act of review or repetition. In the same way, when, by successive acts in time, we master all the parts of some whole in space, as of a building, a landscape, or a complex mathematical figure, we give unity to the whole.

(c.) The most of the cases in which objects are recalled under the relation of cause and effect, will readily be solved by the law of redintegration. As has already been intimated, objects must previously have been connected as cause and effect, in order to be recalled by the force of this relation. Indeed, objects are known as causes by the effects which they produce. Effects are known as such by being referred to other objects or agents as their causes. In many instances, even, it is only through this relation that they are connected at all. But in order to be connected as cause and effect, so as to be recalled the one by the other, they must first have been united under this relation in a previous mental act; and if so, they come at once under the law of redintegration.

What is true of causes and effects, is still more obvious of means and ends. A means can only be known as such by its relation to the end which it is adapted to promote or bring to pass. That is, it must be thought of in connection with the end, as the camels which buoy up a ship, or the diving-bell which enables a diver to breathe and labor under water. The same is true of premises and conclusions, data and inferences, or the so-called logical relations, all of which are referable to the general relation of cause and effect.

(d.) The relations of similarity and contrast present some difficulty. When I see a face never seen before, at once the thought flashes upon me, 'That face is like the face of a friend long absent or dead;' or when I see a horse which strikingly resembles in color, form, or action, another horse which I formerly owned, and the image of that horse is called to mind, the objects that recall, and those which are recalled, were never conjoined in fact. In many cases of similarity, the previous conjunction of the resembling objects is possible, and the law of redintegration may be readily applied, but in instances such as have been adduced, we seem foiled in the effort to apply it. In view of these facts, the law of similarity seems at first to be an original and independent law, and to take its place as such by the side of the law of redintegration.

Others, as Maas (*Versuch über die Einbildungskraft*), have sought to bring it under the same by the following solution: What we see in the resembling face, or the resembling horse, is some special and separable feature or peculiarity, one or more. Let this be called *a*, and let the remaining features or peculiarities be called *b*. Let all the observed features or characteristics of the same, both the resembling and the non-resembling, be called *A*. Let the face or the horse never seen before be designated by *B*. When *B* is seen, the part *a* is seen as a separable constituent, for by the supposition it attracts special attention. The first act is to perceive *B*; the next act, to notice *a*, the resembling feature; but *a* has before been conjoined with *b*, giving the total *A*. As soon as the part *a* is apprehended, it brings back its associate *b*, and *A* is therefore recalled

The relation of similarity occasions difficulty.

How the difficulty is resolved.

When, for example, I look at a portrait of Sir Philip Sidney, I am reminded of its likeness to the portrait of Queen Elizabeth, because of the ruff which is about the neck of each, which in this case is *the only common* feature, and attracts at once the attention. The ruff brings back every thing besides in her Majesty's portrait—the head-dress, the features, the sceptre, the robes, etc., etc., till the whole is restored. So far as the process of association is concerned, it is urged, it makes no difference whether the separable features are or are not actually divisible in space; they must be separated and conjoined in thought, in order to be the medium by which the attendant parts are brought to the mind. If this solution is accepted, the law of redintegration is established as the one comprehensive and sufficient law of representation. In other words, the law of representation would be, 'objects which have been previously united as a part of a single mental state, tend to recall or suggest one another.'

The parts and wholes are not the same, but similar.

§ 248. Shall this be accepted as the law? Before this question is answered, one point needs to be noticed: The part of a mental state which is said to recall or tend to recall the whole, is not literally the same which has previously been an object to the mind. Every time the mind apprehends either a part or the whole, it has a new percept or image, whether partial or total. If, having seen two resembling horses together, I afterward see one, I am impelled at once to think of the other; or if the sight of a third resembling horse makes me think of one or both, there is to the mind in every instance a new object presented and pictured. The percept of the same horse taken in successive moments, or at long intervals, is mentally conceived not as the same, but as a similar mental entity or object. All its force to attract, or suggest, or recall another object, comes not from the sameness of the part or the whole *objectively* viewed, but from the similarity of the two or more mental percepts or mental images regarded *subjectively*, or as the products of the mind's similar activities. Whatever this tendency, or readiness, or force may be, it is derived entirely from the mind's own activity, and not at all from the sameness of *the objects* as parts or wholes. The mind thinks, or tends to think, of *a*, when it perceives or thinks of *b*, because it has previously acted in a *similar* activity, in whole or in part. When *a* occurs to it, whether in perception or thought, a certain form of partial subjective activity begins, which involves, by reason of the fact that the like activity has been previously experienced, a greater facility of repetition. One act of knowledge, as has been previously explained, differs from another act or state of knowledge by the mental object which it produces. One act of knowledge is similar to another, in whole or in part, as it forms in apprehension a similar mental object by the application of attentive effort. One act of knowledge is similar to another, according as the objects thus produced are similar in whole or in part. Even when the object, as in two acts of perception, is one and the same, the mental acts and products are only similar, and therefore are two.

The explanation is not in the objects, but in the mind's activity.

§ 249. The law of redintegration, as ordinarily phrased or enounced, is liable to the qualification which was noticed in § 245, viz., that no attractive force can be affirmed or con-

ceived to pertain to ideas as such. Objects or ideas have of themselves no greater force or tendency to restore those which with themselves made up a mental state, than they have to attract one another. The force in the final analysis must come from and reside in the mind whose products they are.

It will be observed, on reflection, that the law of similarity, so far from being brought under the law of redintegration by this analysis, brings this very law in subjection to itself, because, when we correct the reading of this law, we find that *the same* is only another phrase for *the similar*.

While, then, no objection can be made to the law of redintegration as a popular expression of the comprehensive condition or principle of representation, it must be rejected as defective, because it overlooks the real principle. This is to be found in the comprehensive general fact or law, *that the mind tends to act again more readily in a manner or form which is similar to any in which it has acted before, in any defined exertion of its energy*.

As the result of our analysis, we accept this as the principle which comprehends the so-called laws of association. We have seen that these laws are not physiological, but psychical; that the attractive force by which one idea is said to be able to recall another, does not lie in the ideas as such, viewed as separate from the mind's energy in producing or beholding them: nor does it lie in the relations as such under which the objects were connected in the mind's previous act of uniting them, but in the ultimate truth that, in whatever way the mind may act, it thereby is enabled to act in a similar manner a second time. Its original act is always complex, including objects separated and united, as parts and as a whole, by definable relations. If the mind cognizes a part of any of these wholes, it begins to act in a way similar to that in which it has acted before. The tendency to finish the whole of the act thus begun explains the principle that underlies the laws of association.

This principle explains the force of succession.

This comprehensive law enables us to explain not only the recurrence of two objects that have previously been connected in the same instant of time, but the return of those also which have followed one another in a consecutive order; as the words that form a sentence suggest each other, or the names that have been learned in a series, or the letters of the alphabet, etc., etc. In these cases each object that precedes and follows must have been united by the energy of a single act, else they could not have been observed in relation. It is also true, in many such cases, that the conspiring relation of each part toward the whole of which it is a member, has been often considered by a single activity of the mind, after the parts have been followed in their order by successive pairs in the way just explained.

Explains the power of feeling over the association.

The reference of the laws of the representative power to the subjective force or energy of the mind, explains the influence of states of feeling, as well as acts of the intellect, upon the representative activities. The state of feeling in which I perceive or cognize an object—e. g., a glorious sunset or an interesting story—is often as distinct to my apprehension as the object itself. It should follow that a similar feeling excited a second time ought as truly to tend to recall a similar object, as a

similar object the feeling. That the feelings are potent instruments of memory, is confirmed by the experience of every one. It often happens that a feeling of disgust once occasioned by some object, can never be experienced again without recalling the object itself. This is often observed in the bodily sensations as those of sea-sickness or headache. It is scarcely less conspicuous in the experience of purely psychical emotions when these are perfectly defined or are traceable to some determinate cause like homesickness or sudden fright. In such cases the experience of a feeling which is at all similar to the feeling in question, however dissimilar may be the occasion or exciting cause, will bring back the intellectual cognition with which it was originally connected. We have already explained (§ 229) that in such cases the feeling operates through the agency of the intellect.

Explains the predominance of special associations. § 250. This principle also serves to explain the predominance of certain associations over the intellect and character of different persons. If the tendency to reproduction and recall is an original force, or law, then it is natural that the energy with which any individual act or state of the soul tends to be revived, should be proportioned to the relative force of the original act; in other words, to the attention which is bestowed upon its objects or parts, whether these are objective or subjective. An excited interest is the condition of concentrated attention; for, as has already been observed, aroused feeling awakens the intellect, detains its gaze, and excludes distracting objects. Hence, the intimate dependence of the memory and imagination of different persons upon the character and strength of the emotions, the buoyancy and depression of the spirits, etc. Hence, preëminently, the influence of those commanding purposes and prevailing habits which make and mark the individual man, upon the objects which he most frequently recalls and recombines, under his prevailing and dominant associations. That every man has his dominant associations is universally observed and confessed. The associations of one are those of wit, while those of another are of broader humor. One person abounds in sensuous illustrations and analogies, another in "wise saws" and grave generalizations. One person overflows with associations of vice, another with those of virtue and goodness. The reason is, that the favorite objects of the soul's activity with the one person, are certain classes of objects with their relations; and with the other, objects that are very unlike them. But in every case, the associations by which each recalls objects, follow the energy with which he cognizes them. One man recalls objects and relations which never occur to another, chiefly because the one contemplates these objects and relations, and with intense energy, while they scarcely catch the notice or attention of the other. Open before two men the same landscape, the same picture, the same architectural design; tell them the same narrative, introduce them to the same companion, let them listen to the same poem, lecture, or sermon, and the active intellect of each will be busy in selecting objects from each, discerning them in special relations and fixing them for future recall.

Explains the influence of sensible objects. § 251. Our general law explains also why our associations with *objects perceived* are far more energetic and permanent than those which are connected with objects remembered or imagined. That which is seen with the eye or heard with the ear, other things being equal, holds the attention more closely and longer than that which is merely remembered, or painted to the fancy. It is constantly present, firmly fixed, and held closely before the mind for it to return to as often as it will. It is because of the strength, and the continuance or reiteration of the impressions which sensible objects occasion, that they are fitted to fix in the mind bonds of association with far greater intensity and tenacity than objects that are only remembered or fancied. Even if the object which has been previously perceived is itself remembered, it

brings back its companion or related thought, with far greater readiness and force than if it had been originally a thought-object only. But let the object be perceived a second time, and not merely remembered, and it acts as an associating force with redoubled energy. First, it presents a greater variety and number of parts or points of association than it could possibly do when it was only thought of. Each part or point is also longer before the mind as an object to which it can return again and again. Then the mind, by the very act of bodily perception, is often stimulated to greater activity, and prepared to recall associate objects with proportionate energy.

Associations with home. The associations with home are a fine illustration of this principle. When we merely *think* of the home of our childhood, it brings back a throng of recollections associated with its places and persons; but when we visit our home, we cannot repress them. They are connected with every apartment; they start up from every corner; they attend upon all our walks; there is not a tree, or rock, or stream, but thrusts into our very faces, and forces upon our society, its throng of associate memories.

Objects of imagination have this advantage over objects of sense, that they are more free from unwelcome and unpleasant elements, and are subject more entirely to the creative power. But objects of sense stimulate the associative tendency to greater energy, and furnish it with the greatest variety of material.

Explains the power of bodily states. § 252. Our principle also explains why certain conditions of the body affect the power to recall, both favorably and unfavorably. Objects apprehended in conditions of bodily weakness and pain are often with difficulty recalled. Those which present themselves in the happier moments of vigor, activity, and moderate excitement, are never forgotten. Disease may both hinder and quicken the energies of the soul to acquire, and, of course, to reproduce its acquisitions; for, in all these cases, the tendency to reproduce is measured by the energy of the original activity; and this varies, as the body helps or hinders the mind to detain and concentrate its attention (cf. § 244).

Explains why a part and not the whole is often represented. § 253. The principle which refers the tendency to be reproduced to the original energy of apprehension and experience—in other words, of cognition and feeling—enables us to understand why the mind represents only a portion, and often but a single element or feature, of an object presented. We perceive a complex material object; we read a written page; we examine a fine drawing, engraving, or painting; we hear and understand an elaborate and convincing argument; we enjoy a succession of pleasurable sensations or emotions. But we bring away or possess the power to recall, only a few parts or elements of each. The explanation has already been anticipated, by the obvious fact that our apprehension of comparatively simple objects consists of many separate acts of analytic and energetic attention upon the separate parts. When all these parts are spread before us, in the relations of

space, we select at our leisure those which solicit our notice. When they are no sooner given than they are gone, as in hearing a discourse, etc., we seize upon selected portions, and make them our own by an energetic response which accompanies the hearing, or by an earnest review which immediately follows. In both cases we often gather, by a unifying act, all that we have thus noticed. What is material to our principle, is that we can represent no more parts or features than we energetically present to our cognition. In both cases, what is called an element, part, or feature, may be as truly the single vague impression which strikes the senses or the mind from the combined action of the whole, as the combination of parts in an orchestra, the mingled sounds that come up to the ear in the din from a great city, or the general impression to the eye of an object seen or a few points vaguely noticed by a careless reader or hearer. Whatever the parts may be, or however they may be conceived, the principle remains true that that, and only that, which is appropriated by the mind by its energetic activity, tends to be revived by a similar act of representation.

Explains why relations are so important.

§ 254. Again, it is essential to an act of knowledge that its objects be discerned in some relation. Even states of feeling are moved and excited by the discerned relations of objects, as truly as by the apprehension of their unrelated existence. When the mind is at all developed, that which arrests the attention and excites the interest is not the sole and single part or element, whether of a sense or spiritual entity, but the part or element as related to some other part or whole, present or absent, perceived or thought of. The relation is often quite as much an occasion of intellectual or emotional activity as the parts related. Sometimes it attracts the exclusive attention, and the entities concerned are set aside and overlooked. I may listen to several similar sounds from different musical instruments, or human voices; the sounds compared may scarcely be noticed, only the circumstance that they are similar. Twenty effects may be produced by a common agent or cause. That they are is scarcely observed, for the attention is occupied by the common relation by which they are connected. In hearing a person read, or in reading ourselves, we often do not notice the words; the mind takes up only the relations which constitute their meaning.

Finally, why certain classes of relations give the laws of association.

§ 255. These facts explain why it is that the relations of objects, and especially why three or four more prominent relations, figure so conspicuously as laws of association in most of the modern treatises on psychology, and how this circumstance is to be reconciled with the principle and method of explaining these laws which we adopt. The mind can rarely be moved to energetic activity except some important relation, binding two or more objects together, holds the attention and excites the feelings. The relations named are none other, as we shall see, than the comprehensive or general categories which connect

and conditionate all our knowledge (§ 515). These relations are the laws of association, inasmuch as they are conditions of original cognition. Whatever we know energetically under these relations, we know a second time under and by means of one or more of these categories.

II. *The secondary laws of association.*

The secondary laws defined.

§ 256. The theories which we have considered thus far chiefly relate to what are called the primary laws of association. Other laws have also been proposed which are called *secondary*. The *primary* laws are conceived as those which account for the tendency of any objects to recur or be represented to the mind, by means of the several classes of objects or relations which have been considered. The *secondary* laws are conceived to regulate the recurrence of one object in any class rather than another. They might with propriety be called laws of the preference or precedence of particular objects. They are designed to explain more particularly the operation of the representative power. Whether these secondary laws may not also be explained by the principles already reached, remains to be seen, after subjecting them to a critical examination.

The same enumerated.

The secondary laws have been enumerated and propounded as follows: (1.) Those objects are more likely to be recalled, other things being equal, which occupy the mind for the longest period of time; (2.) those also which are apprehended most vividly; (3.) those which are brought most frequently before the mind; (4.) those which were most recently present; (5.) those which are the most free from entangling relations; (6.) those which are contemplated with the greatest strength of emotion; (7.) those which are viewed with favoring circumstances of bodily health; (8.) those which are coincident with prevalent habits; (9.) those to which the original constitution of body or mind predisposes us with the greatest interest or aptness (cf. Dr. Thomas Brown, *Lecture 37*).

How far reducible to the same principle with the primary.

§ 257. A critical examination of these laws will enable us to reduce them to some general expression. Perhaps it will show that both the secondary and primary rest upon the same general principle. The first, concerning length of time, has already been shown to be a necessary incident to the operation of the general law for which we have contended, that an attentive or energetic apprehension of objects in their relations is a ground of their tendency to be recalled. The so-called objects with which we have to do, are ordinarily complex, each part holding many relations to one another and to other objects. Some length of time may be necessary, it is always favorable, to the varied and repeated applications of the intellect to those objects and relations, which will awaken the mind to its highest energy. The second is nearly coincident with our fundamental principle.

The force of repetition.

The third presents ground for inquiry. Why does simple repetition give any advantage? We answer: A second look, especially if it follows that which went before after a considerable interval of time, presents the object as divested of the distracting influences which novelty imparts. It is taken

when the mind is critical and cool—when it inquires whether its former judgment was correct. Each new or repeated view, whether near or remote, reveals some fresh relation to some familiar or novel object, and thus increases the chance of its being suggested to the mind a second time. For example, by one act the diamond is apprehended as the brightest, or the hardest, or the most costly of the gems; and so, when the gems are thought of, the diamond is suggested. By another view, its relation to carbon is discerned, and then the diamond will be recalled when charcoal, or marble, or carbonic acid are present to the thoughts.

The fourth law is, that an object contemplated recently, is, if other things are equal, more likely to be recalled than the same object if viewed longer ago.

The recentness
of the object
thought of.

A countenance casually and hastily seen an hour since, may be recollected or recalled by another similar face within this short interval of time, but be lost forever if the occasion which suggests it does not soon present itself. The fact is unquestioned, and it may perhaps be an ultimate fact. It rather concerns the loss or waste of power, than any positive force or tendency. If expressed in the language or terms taken from the general principle which we have laid down as fundamental, it would be thus phrased: "the tendency of any act of the mind to be recalled or repeated is weakened by disuse, till, finally, it wholly ceases." Whether it is properly said to be weakened, or superseded, is an open question. This is true of the kindred question, whether any acquisition of the mind can be irrecoverably lost (cf. § 290).

One palpable and prominent exception to this general tendency to weakness or loss may be urged, in the frequent cases of persons who in old age remember nothing so vividly as the scenes and events which occurred longest ago.

The memory of
old age.

Often the whole of the intervening life is entirely erased from the soul, while the memories of youth and childhood are still vivid and distinct. Several reasons may be given for this plain exception to the operation of the laws already considered. Many of the remembrances of childhood have been recalled again and again through a long life. These objects have been suggested by a great number of occasions, have been viewed and reviewed under the greatest variety of relations, and been attended by the strongest and the tenderest emotions. Though the events of childhood, as *realities*, were present to the mind longest ago, yet, as thought-objects, they may be the most fresh and recent. Nor should it be forgotten that the objects and events of childhood were contemplated by the mind at first with an almost exclusive and absorbing attention. The few persons that stand out in so bold relief from the background of life when life is reviewed, filled its entire foreground when life was all in the future, for they were the only persons with whom the child was brought in contact. The memorable occurrences of childhood were the absorbing subjects of thought for days before they occurred. They were often reviewed with fond reflection after they were past. The learning to count ten or one hundred, the wearing a certain dress; the beginning of school-life; the long-anticipated, the often-reviewed and recited visit to some relative, the first considerable journey, the first party, the first composition—were most important occurrences in their time, and spread themselves over a large portion of the horizon of the infant life.

The fifth law (which relates to entangling relations) has already been provided for. If the points or features to which these relations, and the thereby related objects, are attached, are very numerous, the greater is the probability that the object will be recalled, provided the relations, and the related objects, be

The force of en-
tangling rela-
tions.

discerned with equal energy of attention and ardor of interest. But if the multiplicity of relations divides and thus weakens the interest, the influence of their number is distracting and entangling. In illustration of the operation of this law, Dr. Brown observes: "The song which we have never heard but from one person, can scarcely be heard again by us without recalling that person to our memory; but there is obviously much less chance of this particular suggestion, if we have heard the same air and words frequently sung by others" (*Lectures* § 1).

Upon this we remark: If the frequent repetition of the song has the effect to withdraw

the attention from the first impression, and to exclude its being often repeated and revived, then it becomes less likely that the person who sung it for the first time will be suggested by the air; but if, every time it is sung by any one, that person is recalled, then the song will be more ineffaceably associated with him the more frequently it is sung.

The *sixth* and *seventh* have already been noticed and explained (§§ 251.2). The *eighth* needs but a word. So far as facility of association depends on repetition, and so far as particular habits facilitate repetition, so far is this general fact resolved by the law concerning repetition. So far as habit, or easy repetition by habit, enables us to concentrate the attention with greater energy and interest, so far is its power explained by the strength of the single or repeated apprehensions for which habit provides.

The *ninth* law supposes that there are original differences and aptitudes in different individuals for certain classes of associations. This is doubtless true. But it should never be forgotten that these original aptitudes do not pertain to the faculty of representation or the so-called faculty of association *as such*, but that it extends equally to the power of presentation and intuition. Whatever we energetically observe or connect by relations, in original intuition, we revive by association. The range of the objects which we can recall depends on the range of objects and relations which we can apprehend. The special aptness which we have for representing objects, depends on the aptness with which we present or acquire them. There is no special aptness for special associations, or for various and ready suggestion, separate from a readiness to discern special classes of objects and relations, and to discern them with interest and energy.

Apparent exceptions to the law of association.

§ 258. There are what seem, on the first aspect, exceptions to the universal application of the laws of association.

While no one can doubt that many thoughts are suggested from the past through a manifest and discernible connection with objects or thoughts that are present, there are many cases of apparent deviation from this rule. It would seem that, if the rule were worth any thing, it ought to be universal. And yet there are many cases when a thought seems all at once to dart into the mind, which has no apparent connection with any thought that is present. In many such cases, the connections can be traced through all their concealed and circuitous ways, and the several objects that served as media can all be uncovered one by one. We cite the familiar story recorded by Hobbes: "In a company in which the conversation turned upon the late civil war, what could be conceived more impertinent than for a person to ask abruptly, What was the value of a Roman denarius? On a little reflection, however, I was able to trace the train of thought which suggested the question; for the original subject of discourse introduced the history of the king, and of the treachery of those who surrendered his person to his enemies; this again introduced the treachery of Judas Iscariot, and the sum of money which he received for his reward" (*Leviathan*, p. i. c. 3).

This story is better worth repeating for its antiquity, than because of the singularity of its matter. It has served as an illustration of the operation of association in all the books since Hobbes' time. But the case is no more singular nor striking than the experience of any lively mind could furnish in every half-hour. If any person not absorbed with the objects

of sense, or bent upon some present achievement, will break in upon his movements of reverie with the question, How did this or that thought occur to my mind? he will be surprised, and perhaps amused, at the series of strangely connected thoughts which introduced it to his notice. In many cases, the thought, though abrupt and strange, will be found to have a real connection with the thought which it seemed to jostle and displace. There are thoughts, however, the connections of which we cannot trace out. What ought we to believe in respect to them? Should we still hold that the law of association governs their movement, though we cannot trace its presence or furnish the proof of its working?

§ 259. In answer to this question, two opposite views have been maintained.

Two theories
for their explanation.

The first is held by Dugald Stewart and others—that the mind is momentarily conscious of the presence of these intervening objects, though it cannot recall them in memory; that the media of association are present long enough to act as links of connection, but not long enough to leave any trace upon the memory. Thus, when the object *a* was known to be present, and all at once *r* darts into the mind—though we did not know how or why—it was nevertheless true that *b*, *c*, *d*, and *x* did occur to the mind each long enough to suggest the other, and so the mind was carried on to *r*, on which it rests with distinct and conscious apprehension, though it cannot recall one of these intervening objects.

The second theory is urged by Hamilton, following a suggestion of Leibnitz, and agreeing with the school of Herbart. These all contend that, 'though *b*, *c*, *d*, and *x* were present long enough to influence the train of consciously associated thoughts, yet the mind was in no sense aware of their presence; for it is unphilosophical to suppose an object present to consciousness without leaving some impression upon the memory. No analogous cases can be adduced, and the hypothesis must be rejected as groundless.' Besides, it is urged, 'another principle can be adduced to explain the phenomena—that of latent or unconscious modifications of the mind. In this we have a recognized and actually existing law, which is sufficient to account for all the facts, and which ought therefore to be accepted as their valid explanation.'

Upon this argument we observe, that it is not true, as is represented, that there are no grounds on which to rest the first hypothesis. In the very case supposed, when *r* suddenly and strangely follows upon *a*, if we bethink ourselves at once, we can recall some intervening links of *b*, *c*, *d*, and *x*. We say, if we bethink ourselves at once; for if the effort is made a few instants later, the clue will fall from our hands. At other times, when it seems to have totally escaped and eluded us, it can be recovered by persistent effort and determination. Now, the fact that in some apparently desperate cases we can succeed, demonstrates that the objects might have been—nay, that they actually were, present to the consciousness, though they seemed not to have been. We have a right to infer, then, on grounds of analogy, that they are so in all cases. The analogy of acknowledged and similar phenomena is wholly with the first theory. Moreover, analogy would seem to suggest and confirm the principle, that where there is a feeble activity of consciousness, there is a feeble hold upon the memory; and we conclude conversely, that where there is the slenderest hold upon the memory, there must have been the feeblest possible energy of consciousness. The advocate of the second theory would argue, that where there is no memory, there can have been no consciousness. We have shown that in instances in which there seems to be no memory, memory is present, but with feeble energy; and we have reason to conclude that it may always be so, when the effect argues the presence of conscious activity. What is intended by the phrase, *the latent modification of consciousness* is not altogether clear. If it be explained as only a very low degree of conscious activity, the two theories are in principle the same.

Representa-
tion unceasingly
active.

§ 260. The representative power tends to unceasing activity. The mind, if given up to the operation of the laws of association, would never cease to furnish itself with new objects. Each object last discerned would suggest another. This would call up its fellow, and the series of successive objects would suffer no interruption and would come to no end. It has been said with great effect—and the thought is a pregnant one—that, were the senses excited to action only long enough to furnish the soul with requisite material and fully to develop all its powers, and then to be sealed up forever, the spirit would have acquired material enough for its endless activity, and its activity in simple representation would go on forever. (Bishop Butler, *Analogy*, p. i. c. i.) We know from observation, that when the other activities are as nearly suspended as is possible, as in dreaming and reverie, the train of associated objects still rushes past the eye of fancy with a rapidity that cannot be measured. In cases of an abnormal excitement of the brain, it seems beyond our control, and we suffer intensely from the energy and swiftness with which thoughts of every variety force themselves upon our notice, while we can neither retard nor regulate their course. But strong as this activity is, and difficult of control as it at times may be, it does not often assume exclusive or supreme possession. There are two methods by which this activity is interrupted and turned aside. The one is objective, the other is subjective.

Objective inter-
ruption to this
activity.

§ 261. We consider, first, the *objective* interruption. Every new object of sense-perception introduces a foreign and diverting element. Representation gives way to presentation or acquisition. We do not deny that both these activities may be excited together, and that two series, of presentation and representation, may go forward side by side. It would seem from experience that this often happens. In waking gently from sleep, the images of the dream-world blend with the realities of the sense-world. Even in our waking hours, the hard world which the senses give us, is constantly blended with the spirit-world in which we dream. Even in the thronged city, the crowded assembly, the pictured theatre, and the musical concert-room, when the entire energy is tasked and excited to do justice to the numberless objects that address the senses, the fancy is often apparently as busy as ever in its more crowded and exciting world, and finds itself hundreds of miles distant from the absorbing scene. The soberest world of the most prosaic and practical thinker is a silver tissue sparkling with the images which the fancy will persist in interweaving into its homely fabric. Let all this be admitted, and still it is true that the two species of activity cannot occupy the attention at the same moment with equal energy; and that the sense-world and sense-objects will break in upon the activity of the fancy. Let but a single object do this for a single instant, and a starting-point is furnished for a new train of thought in an entirely new direction.

Subjective interruption.

§ 262. The *subjective* interruption, diversion, and control of the representative activity of the soul, are still more important. The *ego* which at times may seem to be the helpless victim or the amused spectator of this moving diorama, is not always an idle or passive looker-on. It has but to detain any single object by simple caprice perhaps, or at the impulse of interested emotion, and the object detained and repeated suggests new objects, to each of which it sustains many relations. By simply arresting the course of representation, its independent activity is as truly controlled and newly directed as if some object of sense had obtruded itself upon the attention.

But the mind can do that which is far more effective and important than to detain an object before its attention from simple impulse of emotion. It must exert upon every such object its higher and nobler activities, for it cannot repress them. If it cognizes the existence of the object, it discerns it as present, and as diverse from itself. It may remember it as having before been present. It may compare it with other objects, bring it into a new or a familiar class, name it, reason about it, make from it some induction, mould from it some imaginative creation, apply it in illustration or analogy, discern in it relations of beauty, learn from it some moral lesson, or find in it some manifestation of the divine. Each one of these activities will evolve a new product, which product may serve as a starting-point for a new series of representations. These activities are far more potent and effective than the merely passive services of the representing power, though they blend with them so intimately as not easily to be distinguished from them. So rapid are all these higher actions to a well-trained intellect, that the mind seems to be pouring out the ore of gathered wealth at the feet of the recipient, when it is, in fact, recasting and restamping each portion anew. As the mind mingles the thinking power with the activity of perception, when it seems only to see and hear with the organs of sense, so does it elevate and transform its acts of memory and fancy by the penetrating analysis and combining synthesis of rational judgment in all the varieties of activity and production.

We have already shown (§ 234) that the representative power is that which is pre-eminently serviceable to thought. It works more rapidly than sense or consciousness. It in fact elaborates the actualities of present and raw experience into refined materials for thought to rework a second time. It enables the rational power in many ways to proceed more quickly, and with fewer encumbrances, to its own results.

Association not the only nor the most important power.

§ 263. That is a most superficial and untrue conception to take of the representative power and the laws of association, which resolves into them all the nobler and more important operations and products of the human soul. Such a view excludes individual energy and self-respect—as well as the capacity for moral relations to one's self, to our fellow-men, and to God.

In one aspect, the mind may be properly said to be entirely dependent on the necessary workings of the laws of representation. It cannot think of any object which the phantasy does not bring within its field of vision. If phantasy be limited, or feeble, or slow, or torpid, through original constitution or the neglect of culture, it will furnish these objects slowly, and scantily; if it be rapid and energetic, it will marshal them swiftly, and strongly, and abundantly. So far as it acts as phantasy only, it obeys these conditions; but this it does but rarely when in a normal and wakeful state. So far as it reacts upon the materials which phantasy furnishes, or coacts with itself as *representing*, by also *thinking* and *creating*—which it does almost always—so far does it direct, and originate new trains, and, in so doing, exert its active power.

Dependent very largely upon the emotions and will.

This active power is to a great extent dependent on the strength and direction of the emotions and sensibilities. What a man makes of the materials which representation furnishes by detaining or elaborating them, will of course depend upon his feelings, both momentary and permanent. The feeling which happens to be uppermost will direct to the acceptance or rejection of the thought which pleases or displeases. The desire which prevails will direct to the use which is made of the object while it is thus detained. Permanent moods or habits of feeling in this way direct the energies. The voluntary activities and states, so far as they control the feelings, become the moving forces to all the other acts and products of the soul.

Indirect control over the associations.

§ 264. Besides this direct action upon the representative faculty, there is another which acts indirectly, if possible with still greater effect. The action is direct when, in the ways described, the *ego* arrests and modifies the onward current of what would otherwise be passive tendencies. It is indirect so far as, by every such action, a greater facility or force is given to such tendencies for the future. Every present energy of attention, every special effort of creation or thought, gives additional strength to certain bonds of association, and imparts special facility to the mind in reviving their objects. A preëdence is thereby established for certain trains of thought. They come a second time, and ever afterward, more easily and naturally. This very circumstance enables us to apply the mind to similar objects with less effort and greater pleasure, till, at last the mind has created for itself almost a new medium of life, a second atmosphere for its own easy and familiar action, which is purely the product of its own previous activities. The feelings provide for their own perpetuation and increased force as they direct to this or that intellectual activity; as they furnish for the next occasion the very objects and relations which are the best fitted to excite them a second time, and end at last by giving them almost exclusive possession of the soul. The habits of feeling, the moods of good or ill temper, of depression or cheerfulness, of openness or suspicion, in this way tend to become permanent and more intense. Hence, preëminently, every controlling or commanding purpose, whether morally good or bad, tends

to perpetuate itself, and to secure the execution of its own behests. First, it prompts the mind to detain those objects which have relation to itself; second, it impels it to consider them with the utmost force of attention. Thus are developed and strengthened those tendencies, in obedience to which the mind learns at last to think of those objects, and only those, which it requires, and to use them in its service with dexterity and readiness. Under the constant presence and guiding control of such a purpose, all the trains of associated objects become its "ready servitors," which bring to mind, when needed, the facts and suggestions, the illustrations and arguments, the happy phrases and expressive words, which are required for thought, expression, and act.

Illustrations
from common
phenomena.

Various familiar phenomena illustrate the force of these indirect influences upon the representative faculty. The same material object suggests to different persons associations that are entirely unlike and even opposite to one another. The scene, the house, the apartment, which to one man is full of the deepest interest, is to another indifferent. To one person it recalls suggestions fraught with peace, affection, and joy; to another, memories of hatred, remorse, and terror. The name of this or that great personage is fragrant with inspiration to the ear and soul of some; while from the mind of another it elicits the response of simple recognition. To one man, the names of Kepler, of Newton, of Raphael, or of Beethoven, call up simply the place and date of their birth; to another, the thought of their achievements; the one may incite to special reflections upon their science or art; the other to the secret of their skill and success. To the same man, on different occasions and in different moods, the same object will suggest different associations, according to the feelings of the hour or the purpose for which he is thinking. We may almost say without exaggeration, that in every present activity of the mind there is revived and indirectly made to reappear the whole of the man's previous history, as each of its acts and events have been taken up by the force of the soul's purely passive tendencies, and so incorporated into its very essence.

§ 265 The law of association, according to the views of its nature and energy which have been enforced, rests upon the same original principle which explains the law of habit. One object suggests another, because one mental state which is similar in part to another tends to be like it in every particular. This principle, when expressed in other language, is equivalent to—any mental activity or experience, when it is repeated, is more readily performed.

Which is resolved
into the other?

The question has often been mooted, and sometimes earnestly discussed, Which of these principles is fundamental and original—the principle of association, or the principle of habit? Reid contends for the principle of habit (*Essay*, iv. chap. 4). Dugald Stewart urges that the principle of habit can be resolved into the laws of association (*Elements*, p. i. § 6). Hamilton observes, in a note upon Reid, that "we can as well explain habit by association, as association by habit." This last remark is true only if we admit—as Stewart, Hume, and others, seem to assume—that association is to be resolved into an attractive force between kindred ideas or relations as such. We have contended that such an attraction, as a force independent of the relation they have to the subjective state or activity of the mind apprehending them, is altogether inconceivable. If the force is derived from this source, then it must be resolved into the law of facility of repetition in similar acts or states. Hamilton, in accepting the law of reintegration, is

forced by consistency to adopt the same theory, and in the last analysis to "explain association by habit."

§ 266. Which of these is the more philosophical theory is evident not only from the considerations which have already been urged, but from the very conception of habit and its operation in all the departments of being in which it prevails.

Habit, Lat. *habitus*, Gr. *ἔξῆς*, is literally a way of being held, or of holding one's self. Thus defined, it must denote a permanent state of rest which has been reached as the result of action or growth, or a permanent form of activity, or of readiness or facility for any kind of activity. As such facility for action is universally observed to result from repetition of action, this last element is taken up into the conception or definition of habit. The acquisition of facility by repetition, supposes that some difficulty or hindrance has been overcome.

In whatever department of nature habit is observed, often a difficulty is noticed in the beginning, whether the habits are purely psychical or corporeal, or whether they are both physical and mental conjoined; whether they are emotional or moral, or whether, as is often true, they are all three together.

Examples of bodily habits are furnished by a particular gait; the dexterous management of the hand in the use of a saw, a chisel, a hatchet, or a plane, in driving or in drawing; and the control of the limbs in dancing or gymnastic feats. The acquisition of such habits does indeed usually involve the use of the mind, and the gain of facility in such use. But we may consider apart the formation of the body only to a new habitude, and for the moment have to do only with the changes in the states and functions of the body which *our senses observe* to be more and more readily made. We will afterward consider the more facile and dexterous dealing of the mind with the body through the sensations of which *we are conscious*. We suppose, that at the outset the special use required is difficult, either because some habitual and undesirable adjustment or predisposition of the muscles has been attained, or because they are imperfectly or wrongly adjusted by nature. An effort is required involving physical tension or physical pain; as when we would bring the organs to utter the unused sounds of a strange language, or would bring the fingers or the limbs to painful or constrained positions. We may explain the obstacle or hindrance by a certain power or tendency of the reflex activities of the nervous system. The conquest may consist in the facility which it is possible to acquire, by a gradual assumption by the reflex motors of new forms of muscular adjustment. Whether or not this is a satisfactory explanation of the difficulty and its conquest, the difficulty and its conquest are observed and experienced in the attitudes and adjustments of the body. That the human body, in its growth and training, is capable of acquiring, by use, the facile and even spontaneous use of its powers, is an original fact which is too obvious to be questioned. With this law or principle, which operates in and over the body, it is obvious that the association of ideas or sensations can have nothing to do, for there are no ideas or sensations to be associated or united together.

§ 267. We pass next to mental habits—*first*, those which are developed in connection with such bodily adjustments as we have supposed; and *second*, those which concern functions

that are simply and purely mental. Side by side with the new adjustments to which the muscles are constrained with a more and more ready obedience, there must proceed a constantly increased facility in the mind's connection and control of the appropriate sensations, according to the ends which it intends to accomplish; or rather, the movements of the mind are the real beginnings of the new adjustments and growths of the body. The juggler and the gymnast, the mechanic and the artist, the dancer and the player on the violin or the organ, do not simply train the bodily organs to the requisite suppleness and aptitudes, but they acquire a surprising readiness of the mind to connect with every movement the sensations which indicate the activities and efforts to which the body is physically trained. If a mental facility supposes a mental difficulty, what is this difficulty? It is, first of all, a difficulty of mental application to certain mental objects, and, with this, a difficulty in the ready mental combination of the objects which are required. This intellectual obstacle is usually increased, and in some cases wholly occasioned, by one that is emotional or moral. The occupation of the mind with this particular class of objects, or of objects in this special form, is not agreeable. Hence, the great secret of success is to excite an interest of some kind in the subjects that are proposed or the efforts which are required. A difficulty or hindrance of some sort must be supposed as an original fact, in order to explain the universal and palpable necessity and attainment of intellectual progress and growth. The force to be overcome cannot exist in ideas or relations as such, but in the mind's own acts concerning ideas and relations. If this is the case, the difficulty must arise from an original deficiency in the aptitudes of all men for certain applications of the energies to certain objects and relations, and for the exercise of certain mental powers. We must, as has already been asserted, assume as an ultimate fact that for all men a certain exercise of sense-perception is easy, while the close application of consciousness is difficult. So also concrete knowledge is easy; generalized or abstract knowledge is difficult. To some, the study of language is natural, while the study of the mathematics is especially repulsive.

In habits that are purely mental, as in the greater facility that is acquired by study in general, or the surprising progress which may be made in any special science, as the mathematics or the languages, or the still more unlooked-for dexterity which may be gained in certain intellectual feats, as of punning, rhyming, etc., etc., the difficulty lies in a reluctant or unwonted attention, and the dexterity pertains to the subjective tendency toward similar activities which is acquired by exercise. The difficulty and the facility are assumed to be unquestioned and original facts.

When the habits are purely emotional or moral, so far as they can be conceived as such, the difficulty to be encountered is a natural or acquired tendency in an emotion to excessive and abnormal activity. This tendency can be overcome only by the frequent exercise of other emotions, till they act with proper readiness and strength. Leaving out of account the voluntary element, or rather

Wherein the difficulty lies.

Emotional and moral habits.

supposing that this is rightly adjusted, it may be assumed that this original difficulty in the natural tendencies remains when the new habits are to be acquired.

The completion of moral or emotional habits ordinarily involves also the training of the intellectual habits to the ready suggestion of new thoughts, and very often of the body itself, to readiness in appropriate actions.

This general survey of the extent and common features of the conditions and the operation of habit brings of itself an argument of strong probability in favor of the view which we have taken, that the law of mental suggestion or association is only a special form of this general law or principle.

Higher and lower laws of association.

§ 268. The laws of association are again divided into *higher* and *lower*. The lower, are those which are presented to us in the acquisitions of sense and consciousness, and which are reproduced by the representative imagination or the uncultured memory. These are the relations of *time* and *space*. As they are more obvious and natural, they require little of higher culture or discipline. They are also developed earliest in the order of time, and are common to the whole race. The relations of likeness and of contrast form an intermediate class between the natural and the philosophical; being now present in the one, and then largely represented in the other. The higher, are the relations of *cause* and *effect*; involving *means* and *end*, *premise* and *conclusion*, *datum* and *inference*, *genus* and *species*, *law* and *example*—all, in short, of the so-called *philosophical* or *logical* relations. All these are present in and control the higher imagination and the more developed processes of thought

In what sense higher and lower.

It is to be observed, that these relations are not higher or lower in the scale of rank or dignity, as relations of association or representation merely, but as relations of original acquisition and thought. Inasmuch, however, as the intellectual power of men and their individual peculiarities, as well as the character of the products which result from the peculiarities of thought and feeling, depend on the movements of the representative faculty; the rank, the comparative dignity, and mutual influence of these relations, deserve special consideration. What a man is, is conveniently described and most satisfactorily accounted for by the recognition of the leading connections and guiding principles after which thoughts come into his mind. The products of his intellect in his conversation, his writings, and his reasonings, as also in his beliefs and his principles, reflect the operation of these relations as lower and higher (cf. Dugald Stewart, *Elements*, p. i. § 6).

The higher often prevail over and displace the lower.

§ 269. The higher relations of thought and of the creative imagination are so diverse from the lower relations of sense, that they often supersede and displace them, if they do not cross and contradict them. In sense-perception and consciousness, objects most opposed and incongruous are conjoined, just as they happen to present themselves in space or in time. The mechanical memory or imagination servilely reproduces them under precisely the same relations in which they were originally presented and known. But thought and the higher imagination take the objects thus accidentally conjoined, and recombine and reproduce them under the relations that are higher; selecting, perhaps,

a few prominent facts or elements as the prominent objects of its intellectual energy, and leaving the rest unnoticed and unregarded. It is quite easy to see how it is possible that this higher activity of representation may in many individuals greatly prevail over that which is lower, so far even as to exclude the normal and natural influence of the latter. By such excess, many not uncommon diversities of intellectual and moral character can easily be explained, and those striking idiosyncrasies of imagination and memory can be accounted for which are designated by the vaguely-used term, *absent-mindedness*.

Absent-mindedness explained. The *absent-minded* person is one who has habitually become so indifferent and inattentive to the objects which address his senses, through preoccupation with a roving imagination or abstracted thought, that his senses seem often to be unused, and his memory to be utterly untrustworthy. He becomes sublimely, or perhaps ridiculously, indifferent to the common relations of common objects and events. The effect upon the memory and the imagination of a similar reversal of the intentions of nature, will be explained under the appropriate heads.

The lower displaces the higher. § 270. As the higher may take the place of the lower relations, so the lower may exclude or displace the higher.

The constant or even the frequent conjunction of objects and phenomena may in consequence be mistaken for their necessary relations or essential conditions or constituents. A savage, who should see gunpowder exploded by an electric spark, would associate the whole of the electric apparatus, and perhaps even the words and the dress of the operator, with the occurrence of the explosion, and take the combination to be made by a necessary connection of things. The ignoramus who sees a conjurer perform certain manipulations, or hears him repeat the words of some incantation in connection with a surprising feat, unites the two by an association so inveterate as to believe that the one is the cause of the other. The manifold and inveterate superstitions that have been so readily accepted and so tenaciously retained, are in this way to be explained. Startling or noticeable events have occurred together by a merely casual connection, which have been henceforward associated as essential the one to the other; as, to success in battle, the healing of disease, the removal of an epidemic, the termination of drought, the cessation of an eclipse, or the acceptable performance of some religious rite.

We assume that the original observation of the relation of events conjoined, may have been hasty, and that the judgment reached has been in consequence unauthorized. There has been no real discernment of the cause, or law, or adaptation that was sought for. Some accidental connection has taken their place, and the objects casually united in a hasty observation being perpetually presented in a conjunction of time or place, are associated so fixedly, that the philosophical or religious superstition has a show of plausibility or reason. Whether it has or not, it retains its hold upon the mind. Nor are errors of this sort confined to uncultured and ignorant races or uneducated men. Men of quick association and ready suggestion, even if they attain the highest culture in many directions, often scorn that discipline to philosophical thinking of which they stand in special need because, from the very

quickness of their power to combine, they are most liable to mistake the associations of their various and ready wit for the sober and solid relations of thought.

The lower associations affect the feelings most efficiently.

§ 271. The lower associations—those of constant or frequent conjunction—are most observable when they strongly affect our feelings. Objects which are in themselves indifferent, or which ought to be and would otherwise be positively offensive, *excite the intensest* misliking, simply because they are connected in our thoughts with objects which in their essential nature are fitted to please or displease us. For example, a dress that itself, in color, form, and fitting, is tasteful, becomes permanently displeasing, as well as any that resemble it, because it brings distinctly to mind a very disagreeable person who wore it. The remembrance of a journey, or some other event of our personal history, is always unwelcome, because it was connected in our experience, and is therefore associated in our thoughts, with some serious disappointment or calamity. The sight of the surgeon who saved our life by performing a painful operation, is not always agreeable, however sincere may be our gratitude. Certain persons are very pleasing or very displeasing, because they bring to mind memories or thoughts which we cherish or reject.

A dress of the newest fashion may be at first singular and unattractive. But it is soon generally worn by those who are attractive in appearance, graceful and refined in manners, and high in social position. It is soon regarded as in itself highly graceful and agreeable, till no other is tolerable. It is not long before it becomes common, and this detracts somewhat from its factitious attractions. When it is worn obtrusively by the filthy and vulgar, and becomes conspicuous in connection with persons who are rightfully disagreeable, it is time that this fashion should change, or that some other novelty should appear, in order to relieve the associations of the fashionable world from the offensive taint of vulgarity.

The moral influence of casual associations.

The moral influence of accidental associations is still more worthy of attention, for their power for evil as well as their capacity for good. Pleasing manners, high intellectual culture, the attractions of wealth and position, may be combined with libertine principles and easy morals, and thus become powerful aids and instruments of vice and corruption. The drunken revel may, by the force of associations of this kind, not only be endured as less disgusting, but it may be gloried in by the aspirant after high society, as the sign of gentlemanly breeding and fashionable life. The horrors of the first cigar and the first debauch are greatly alleviated by manifold suggestions that the experience of both are necessary to constitute the gentleman. The easy manners, the gay life, and the generous hospitality of the cavaliers of Charles I., and of the courtiers of Charles II., lent a charm to their cause and a fascination to their name and memory; while the unnatural strictness, the over-stiff manners, and the precise pedantry of the Puritans have caused their pure morals, their patriotic heroism, and their fervent piety to

be odious in the minds of many noble men, and have burdened their very name with associations of contempt and reproach.

§ 272. The force of casual associations is in no particular more conspicuous than in its influence upon language. A

Influence of casual associations upon language.

deed that is abhorrent to the conscience and offensive to the judgment and feelings of right-minded and plain-speaking men, is more than half reconciled to the moral feelings, and perhaps is installed among the virtues, by softening or dignifying the appellations by which it is named—that is, by designating it by words that suggest associations of respectability and honor. Men seek to keep down or to avoid associations of disgust or abhorrence by the device of euphemistic terminology. It is not always true that ‘vice loses half its evil by losing all its grossness; for the very grossness which is its natural manifestation and result, is sometimes the best defence of society against the corruption to which it tends. To seek to divest it of the offensive associations which this grossness is fitted to excite, by substituting associations which are less unpleasant, is often to defeat one of the intentions of nature, which would keep the conscience honest and true, if she cannot make the conduct right (cf. J. S. Mill, *Logic*, B. iv. chap. v. §§ 3, 4).

The power of epithets and names to awaken pleasant or unpleasant associations is well illustrated in the history of parties and in the practice of partisans. A party that is encumbered by an epithet or appellation of odious associations or disagreeable origination, hastens to disencumber itself of an appendage that is more fatal than the shirt of Nessus; while its opponents are as eager and determined that it shall retain the damaging reproach. There are cities of Europe in which the use by one man to another of certain epithets or gestures, which of themselves are harmless and innocent, is resented as the deadliest of insults, simply because these are associated with a shameful and humiliating passage in their history. The skilful application of epithets like *Whig* and *Tory*, *Malignant* and *Roundhead*, *Girondists* and the *Mountain*, *Conservative* and *Radical*, is often more efficient with the populace than the most convincing arguments or the most persuasive eloquence. Agreeable associations, through the subtle reaction of language, have not only palliated—they have even recommended the most contemptible follies, the most outrageous violence, and the most abominable crimes.

Even philosophy herself, though professing to be subject to thought-relations only, is by no means exempt from the influence of casual associations operating through this same medium of words. It is often more effective, even

Their influence in philosophy.

in the schools, to apply an epithet, as *sensuous* or *spiritual*, *empirical* or *rational*, *unselfish* or *utilitarian*, than it is to disprove an analysis or answer an argument—to give an opinion an odious name, or apply a contemptuous epithet, than to consider its evidence or refute its reasons. The soberest and the best-governed men are more or less affected by individual associations in their tastes, their preferences, their manners, their reading, their

companions, their politics, and their faith. We could not be wholly aloof or exempt from their influence if we would. We would not if we could; for, in so doing, we should forego much of our individuality, and of that which makes our individuality dear. But it is the interest and duty of every man so far to regulate the influence of such associations, that he does not become the easy victim or the abject slave of chance and arbitrary circumstances. Whatever is right and true cannot be disagreeable, when it is sustained, adorned, and hallowed by associations that are only attractive. Indeed, it is not till the reason and conscience rule so completely over the whole man, as to transform and elevate even the individual and casual associations, that the education of man is complete, and his character has attained that harmony and perfection of which it is capable.

CHAPTER IV.

REPRESENTATION.—(1.) THE MEMORY, OR RECOGNIZING FACULTY

HAVING considered the conditions and laws of the representative power, we proceed to apply the results of our inquiries to the explanation of the principal modes in which its activity is exerted—to the so-called faculties of *memory*, *phantasy*, and *imagination*. The memory comes first in order, because it is at once the most natural and yet the most perfect form in which the power is used.

The elements essential to an act of memory. § 273. An act or state of memory has already been defined to be that in which the essential elements of an act of previous cognition are more or less perfectly re-known, both objective and subjective, with the relations essential to each. These elements are not all recalled with the same distinctness, and hence there are varieties of memory; but it is essential to an act of memory that some portion of each of these elements and relations should be recalled and reknown.

For example: I remember an event which occurred an hour ago—that a friend made me a call, or passed me, as I was walking in the street. What is involved in this act of memory? First of all, I must reproduce the image of my friend as before me, or as he passed; second, I must recall the image or recollection of myself as seeing or conversing with him, perhaps with more or less feeling. Unless both these elements are recalled, the object perceived or in some way cognized, and myself in the act of apprehending and perhaps of feeling—i. e., the objective and subjective elements—the act cannot be an act of memory. If we recall or represent any event or object, and say we remember it, we must also recall ourselves in some act or state related to it. Third, the act of originally knowing the object or event was my act—i. e., I, the same being who now recall and reknow it in the ways described, did know it before. The act of knowing the object, and of having known it, are acts of the *same* being. Fourth, the two acts are in this process also distinguished as before and after, the present as actual, the past, both act and object, as having been actual. This involves the distinctions of before and after, or the relations of succession involving time. Fifth, in the original act of observation I must have been in some place, and the object observed must have sustained some relation to attending or accompanying objects. Neither myself nor the object can ordi-

narily be recalled without some of these accompaniments involving relations to space. Sixth, the objective and subjective elements, and the relations which they involve, thus recalled as images, must be known to represent realities. What is involved in this relation of the image to a reality, and how it is possible, has already been discussed and explained (P. II. c. ii.).

§ 274. These are the necessary elements in an act or state of memory. But though they must all be present and enter into such a state, they need not be present with the same fulness or distinctness at all times, nor with the same relative fulness at the same time. The total complex of objects and relations may be recalled more or less perfectly, or each of the constituent elements may be more or less vividly represented.

These elements may be recalled with unequal perfection.

First: The object of the original act may be recalled with a greater or less completeness of its elements or parts. If the object be purely a thought-object which we remember to have cognized before, or a material object which is now present only as a mental image, it may be only vaguely recalled at best, and its constituent elements may be only very scantily reproduced. Even if it is a sense-object which we perceive a second time, and remember as having been perceived before, it may be that only a very small number of its distinguishable parts can be thus recalled, as having been thus previously perceived.

The object proper, of the original act.

Second: The original act of the mind in the first apprehension may also be more or less perfectly recalled. I see a face in a crowd. I recall it perfectly, and know that I have seen it before; but I cannot revive a single vestige of myself as viewing it, only that I did thus view it I am certain by direct knowledge. And yet we must have this recollection of our previous activity or feeling, or we cannot be said to remember it at all. This certain knowledge may vary from the vaguest possible impressions of our subjective state, to the most vivid and circumstantial reviewal of every part or feature.

It might perhaps be suggested that this is not literally true of all remembered objects, especially of those with which we are the most familiar, and which we are most certain that we have often known; as the streets and houses of our place of residence, or the persons of our most familiar friends, or the facts of familiar knowledge, as the dates of the accession of the sovereigns of England, of the beginning of our own national life, and the myriad familiar facts of school acquisition. We are accustomed to say that we remember these objects; and yet we do not in all, nor in most cases, distinctly recall our act or state when we first learned them, nor any previous act in which we accepted them as true. We may not dwell upon such acts or states, it is true, because we do not give the associating power time or play enough to call up so complete a picture; but if we could not recall some such previous act of perception or assent, we do not properly remember the object.

Its relations of time.

Third: The time when the object was previously known may be more or less perfectly recalled. If I remember an object viewed or experienced half an hour ago, I may recall the

leading events which have happened to me from the present moment backward to the original act of acquiring this knowledge. If it was yesterday, or a month since, I can generally recall the events that were just before and after it, and can connect it with the present by more or fewer intervening occurrences, can fix the date so far as to know that it was in a certain month of a certain year; the attendants of which dates I can recover with more or less fullness.

In some cases, the event stands isolated in the dim and undetermined past. In others, it may not be wholly isolated from the events which preceded, accompanied, or followed, but yet it can scarcely be said to be united with the present by any connecting series of events that intervene.

Fourth: The place where, may be more or less perfectly recalled and recognized. *The place where*, is a phrase which denotes the adjacent and surrounding physical objects in their spatial relations, which form the background and the setting of every object perceived or every act of the person who remembers. Every object previously observed, every act of my own in observing it, when themselves recalled, will bring back this accompanying setting more or less perfectly, according as these accompaniments were originally regarded with a more or less energetic and interested attention, or as a longer or shorter time is allowed for the process of suggestion and recovery.

§ 275. Fifth: The knowledge of the real existence or actual perception of remembered objects may also vary in the degree of accuracy or confidence with which it is held. For this simple knowledge no other explanation can be given, than that the mind is competent to its exercise. The question is sometimes asked, Why do we trust our memory? To this philosophers have sought to give an answer by enumerating certain *grounds* or *criteria*—as that the object must be *clear*, or that the image recalled must *represent* or *agree* with the reality. But all these criteria, or grounds, are merely other words or phrases, which express no more than the act of knowledge itself.

But does the mind always know—i. e., remember—with equal certainty? Does it not sometimes distrust its own act in remembering? And is there not a difference observed between the act of doubting and of confidently remembering, which justifies us in trusting the one and in distrusting the other? We answer: When we distrust our own act of memory, it is we ourselves who are not certain. We seek to be certain; sometimes we succeed, and pass from the condition of painful doubt into that of confident knowledge. The object which was vaguely recalled now stands vividly and distinctly before the eye of the mind. But the clearness and distinctness of the objects are not the real causes which effect, or the logical grounds on which we rest our positive knowledge. The terms *distinct* and *distinctly*, objectively describe the subjective certainty, but do not account for or justify it. When we distrust our memory, we are aware of our own distrust—we are clearly and perfectly certain that we do not positively remember. But as soon as we do remember, we not only know that we are confident, but we know that that concerning which we are thus confident was indeed a reality.

Its relations of place.

The act of recognition may vary in positiveness.

Do we never distrust the memory?

Do we not offer reasons for trusting it?

'But do we not sometimes offer reasons to satisfy or prove to ourselves that what we remember must have been a fact?' We do often enumerate the circumstances which assure us that we cannot be mistaken, but not as logical reasons to justify the conclusion that we are in the right, nor as decisive criteria to distinguish that which is imagined, from that which actually took place. We bring them up as particulars on which we dwell with attention, for the purpose of recreating a more complete and vivid picture of the past. In this sense we are said to refresh our memory—as a witness in court is asked or urged to do, when one or another circumstance is repeated in his hearing, or he is left to his own associations to revive the past. We are sometimes said to verify our memory, but only in this sense: We say, I cannot be mistaken, for it was on such a day and in such a place, and such a person or persons were present, etc., etc.; but all this is simply our own thinking aloud, as we paint into the mental picture one element after another; our certainty all the while becoming more positive. We may indeed urge this number of remembered particulars as reasons why others should trust our accuracy since our remembrance is so full and detailed, but not as grounds or criteria for our own confidence. For this confidence we can give no other reason than that we find ourselves possessed of and using the power for this very function, which is, *to remember*. And yet this act is exercised, as is every other act of the soul, with unequal energy. Our confidence admits of various degrees, from the lowest belief of objects indistinctly recalled, to the highest confidence concerning past scenes vividly and fully reproduced.

§ 276. A more exact and technical description of memory would be the following. Memory is a modification of representation. It supposes the representative power to be required in order to furnish the materials, conditions, or objects for itself to work with or upon, according to the laws of association or suggestion. These objects being furnished, the memory, or the mind in memory, knows them by an act of recognition. More briefly, representation recalls, memory recognizes. The soul, in representation, is passive, blind, and mechanical, proceeding according to fixed and inevitable laws, by methods or processes which occur beyond or out of consciousness. The soul, in memory, on the other hand, is active, intelligent, and rational. The distinction between representation and memory, so far as our actual experience is concerned, is rather ideal than real, for representation passes into memory by an inevitable certainty, through the easiest, the most natural, and usually the most unnoticed transitions. The laws of representation are certain, if suffered to act long enough, to bring before the mind those materials which, when presented, it usually assents to by an act of knowledge or recognition, which is memory.

The psychologists of the associational school provide for only half the process—that of representation. The recognition they attempt to explain, but unsuccessfully, by the chemistry of association—i. e., by the union or blending of a present with a past mental state.

Representation and memory may, however, with propriety and advantage, be ideally considered apart. At times they are really separate. Objects may be represented, but not recognized, through haste, or the diversion of the attention, or some unexplained withholding of the act of knowledge.

Representation
the first element
of memory.

§ 277. Representation, conceived apart from memory, may begin with a *mental image*, and by the laws of its own activity present another, and still another, till all at once the intelligence asserts, 'That one now presented I have perceived or known before.' Or the object may be *material*, and first perceived by the senses. In such a case, representation, at once supplies a completing image or thought, and memory pronounces, 'This very object have I perceived before.' According as the occasion to memory is a mental or a perceived object, do the phenomena of memory differ.

Recognition, the
second element.

Memory, on the other hand, as distinguished from representation, is an act of knowledge. To know, requires objects, and the discernment of their relations. The different kinds or modes of knowledge differ from one another both in the objects and relations known (§ 51). The conditions or objects of memory are peculiar, in that, as has just been explained, representation presents or suggests more or fewer of them. The relations under which they are discerned are, as we have shown at length, those of previous apprehension by myself in some determinate state of knowledge or feeling, at some previous time, and in some particular place. The act of knowledge, while it is thus distinguished from other acts of knowledge by its objects and relations, is, however, like them, in that its objects and relations are realities, and its own subjective condition is certainty (§ 48).

The spontaneous
and intentional
memory.

§ 278. But while we thus distinguish in an ideal way, and by abstraction, the passive and the active element, both must be taken into consideration in order to explain the phenomena of memory; for, in these phenomena, each of these elements modifies the other, and both appear in the activities and products of this most nimble and subtle agency of the soul. The two are related in memory somewhat as sensation proper and perception proper are combined in the acts of sense-perception—the one is inversely as the other. In certain acts and powers of memory, the passive or representational element is prominent and conspicuous; in others, the active and rational is most apparent. According to this feature, we distinguish the memory as *spontaneous* and *intentional*. In spontaneous memory, the object remembered, spontaneously occurs to the mind. In intentional memory it is distinctly sought after until it is found. In spontaneous memory, the representative faculty is prominent, and acts according to its own appropriate laws, while the intelligence waits only to give its recognition to what is presented to its attention. In intentional memory, the intelligence is active, being distinctly aware that some object has been previously known, to recall which it summons the energies of the representative power according to its necessary laws. The two kinds of memory may be advantageously considered apart.

The distinction of these two kinds of memory is so obvious, and is so readily observed, that it is not at all surprising that separate terms for the two have been employed in common

life, and are found in many languages. The Greeks have *μνήμη* and *ἀνέμνησις*; the Latins, *memoria* and *recordatio* (cf. *Cic. de Prov.* 43); the English, *memory* and *recollection*. It is, of course, not pretended—and ought not to be expected—that these terms are always used with precision, or that the two are not often interchanged. The existence of two such terms, each with its appropriate shade of meaning, can, however, only be accounted for by the fact that the human consciousness has observed the differences explained.

§ 279. In the spontaneous memory, there are natural aptitudes and disabilities, which can only be referred to some original difference of the mental constitution, which is properly called a strength or weakness of the original powers. It is almost superfluous to repeat what has been abundantly explained, that such aptitudes and disabilities do not pertain exclusively to the representative energy as such, but run through the whole circle of the intellectual and emotional activities and capacities.

That such original differences do exist, is an unquestioned fact. For example: one person hears a series of unconnected names recited, and can repeat them all in the precise order in which they were uttered, while another can recall only now and then one. The eye of another runs down a column of figures, and he can copy the whole from memory, while his companion can scarcely recall a single one of the whole. One individual can learn a page of prose or poetry simply by reading or hearing it read but once, while another can with difficulty repeat correctly a single line or sentence. The power to perform long and intricate mathematical calculations *in the head*, which, as exhibited by some very young persons, like Zerah Colburn, is looked on as a miracle of genius, and hailed as a sign of extraordinary promise, depends chiefly on the capacity to hold and recall at pleasure the results of previous processes, so that they stand depicted before the mind's eye as though they were written or drawn upon a slate or blackboard. Now and then a rare scholar is met with, who from infancy has possessed the gift of retaining, so as to recall, every date, name, and separate fact which he has ever learned—upon whose mind, in short, every object that has ever been acquired has left its transcript in a vivid and abiding picture.

Original differences in the spontaneous memory.

§ 280. That these differences are natural, is manifest from this, that they cannot be remedied by any effort or art. No discipline of the attention, and no determination of the will, can enable one who is strikingly deficient, to acquire the power of this simple and effortless memory. That the defect lies in some original incapacity, or some ineradicable habit to fix the attention with interest upon the objects to be recalled, and not upon the power of representation, is confirmed by observation upon cases of this kind, as well as by the general law of the workings of the representative power. That the strength or weakness in this kind of memory is not owing to the physical strength or weakness of the organs of sense, but to the mental energy and the moral direction with which these physical instruments are applied, is abundantly manifest. Both these are, however, greatly affected by a normal and harmonized organization and healthy activity of the body, as well as by the coolness and serenity of the temper, according to laws which will be explained hereafter. After making the utmost allowance for the influence

of temperament, health, and circumstances of education and development, we are forced to the conclusion that there is a difference in the original endowments of the soul in respect to the force of its action upon single objects, as well as in the reach or range of the relations which it can discern with effect and recall with success. Analogous to differences in the spontaneous memory—if, indeed, they are not examples of it—are the varying capacities to recall a musical air so as to repeat it, or to revive the image of the voice or manners of another so as to imitate them.

The relations peculiar to it.

The relations which are employed in the natural memory are most conspicuously those of simple contiguity and succession. All memory begins with these relations, because our earliest energies and acquisitions commence with objects of this kind. The strength and range of the memory of facts is more obvious when it is seen as the memory of separate things, than as the memory of their higher relations. The earliest development of this power gives us the most striking exhibitions of the presence or absence of extraordinary natural gifts. In other words, there is a natural memory of space and of time, or, as we may say in a somewhat narrow sense, there is a natural memory of the eye and of the ear. Using these terms, we observe that in some persons the *memory of the eye*, while in others the *memory of the ear*, is conspicuous. Those who are remarkable for the memory of the eye, are such as can readily form and distinctly revive mental pictures of objects in their spatial relations, as form, relative position, outline, and grouping, as also of gradations and contrasts of color. Such persons can readily picture in the mind the details of the front or façade of a building, the outline and filling in of some remarkable tree, the features of the face of an acquaintance or friend, the page of a book as presented to the eye. Those who are distinguished for the memory of the ear, or of time, can recall successions of sounds—if they have a musical ear, of musical notes—strings of names, or words when connected in significant sentences. They can repeat dates of uninteresting events, can retail long stories such as make up the gossip of a neighborhood, or the minutiae of the historic chronicler. Superiority in the one kind of memory is not believed to be usually accompanied by superiority in the other.

The value of a good spontaneous memory.

§ 281. A good spontaneous memory, or, as it is often called, a good memory for facts and dates, is generally and correctly regarded rather as a great intellectual convenience, than as a decisive indication of intellectual power. It is doubtless true, that many persons are distinguished by natural memory, who are inferior in capacity for discrimination, judgment, and reasoning. It has become a common observation, Great memory, little common sense. In such cases, the power of discerning the higher relations may be either originally deficient, or it may be neglected in consequence of the predominant use of the power to apprehend, and, of course, to recall objects in the relations that are most obvious. A very energetic mind may be very limited in its apprehensions, and will, of course, be energetic though limited in its memory. It is noticeable, also, that persons who become eminent in those achievements which are proper to the higher intellectual powers and relations, are in early life usually distinguished for the strength and reach of the memory of the eye and the ear. In many such cases extraordinary powers of this sort are observed in the person's own experience gradually to be diminished, till at last they entirely cease, as the higher powers of the intellect are completely matured, or are more constantly—in a sense—exclusively exercised. This does not invariably occur. There are striking examples of persons who seem to forget nothing, neither in age nor in youth.

The combination of a spontaneous and rational memory.

§ 282. There are not a few who carry into the maturity of age, and into the most striking efforts of judgment and reasoning, a memory that is always clear, vivid, prompt, exact, and universal—a memory that never forgets a name, or loses a date, or is at fault in its recital of facts. Such are the men

of universal knowledge, at least in their own department of study and research, like Scaliger in ancient learning and criticism, Pascal, "that prodigy of parts," Niebuhr in history and statistics, A. von Humboldt in physics both celestial and terrestrial, Ritter in geography, Goëthe in literature and art. The reason that in these exempt cases the higher or intellectual memory does not displace the lower, is that the employments or studies of the individual require him to be conversant with details as well as with their thought-relations, with facts as well as with principles. Hence, the higher memory aids rather than hinders the lower; the acquisitions of the quick eye and ear being fastened and fixed by the secondary processes of reflex thought.

§ 283. The phenomena of the so-called intentional or voluntary memory next require our attention. They are characterized by this one general feature, that the objects remembered, instead of occurring to the mind unsought, are sought for by a conscious effort or act. 'But how can this be possible? The very statement involves a contradiction in language and an impossibility in fact. If the mind seeks, intending to find or recover an object lost, then it already knows what it seeks for. In other words, the mind must already have remembered, in order to be put upon the act of endeavoring to recall.' In reply and explanation, we observe that, if every object remembered were in all cases remembered with equal fulness and vividness, then the objection would hold. If, in order to remember at all, the mind must recall with equal energy and success all which, in the nature of the case, is capable of being reproduced, then 'to intend to remember' would be plainly precluded by our 'having already remembered.' But this is by no means true. The object remembered may be considered as an object—whether *object-object* or *subject-object* is immaterial—out of all conscious relation to the mind viewing or caring for it, or an object in such relation.

Taken in the first sense, the object is capable of being recalled vaguely in its general outlines, and confusedly in its details, or it can stand out before the eye of the mind with the sharpest outline, and inclose a perfect picture of distinct *minutiae*. We can recall a house-front, a pictured landscape, a human face, merely as a cloudlike form, through which scarcely a single distinguishable point is visible, or sharp and definite in outline and full and distinct in detail. Intentional memory is possible whenever the mind can begin with this vague object, and, knowing that it has known it as a reality, can hold it to its attention, till, under the laws of representation, the whole emerges to conscious apprehension in every point, line, and color, and is remembered as real.

§ 284. But the object of memory is more appropriately the object in some relation to the previous activity of the soul in some given place and at some given time. This more complex object admits also of every variety and degree, from the lowest up to the highest conceivable fulness and freshness. This, of course, provides for the possibility that the mind should, in its acts of recovery, go through all the intermediate steps of effort and intention, till the whole object, as objective and subjective, is fully represented and recognized. We may begin with some faint recognition of the object properly so

The intentional
memory defined.

The object
vaguely known
already.

The object in
relation to the
knowing mind.

called, and of the mind's own previous state with respect to it. We are in some sense certain that we have known something of the object. It may be the names in order of the Sovereigns of Great Britain, or of the Presidents of the United States, the date of Magna Charta, or of the peace of Westphalia; or it may be we have charged our minds with a number of acts to perform, as certain visits to make, or sundry commissions to execute, and we can recall all but one, or perhaps two. The sense of deficiency may be a rational or logical inference that we must have known these facts, or it may be an undefined certainty that something is wanting to complete the whole which we once apprehended, or it may be some more or less distinct recall and recognition of our own state when apprehending the object, now vaguely or totally unrecalled.

Several ways of recovering the object sought for.

In recovering the whole, we may begin with that which is eminently objective. We may set off with some object which we are sure, in our previous knowledge, had some relation to that which we seek—as the dates of some events that occurred before or after the one which we look for, the names which we have learned in connection with the one required; and we may dwell upon these till the date or name required occurs to the mind, and we recognize it with welcome. Or we may begin with the subjective element. We may recall ourselves in the act of being charged with the commissions—*where we were, what we were doing, of what we were thinking, how we were feeling*,—till, by this means, the missing element reappears to make our recognition complete.

§ 285. It has already been asserted, that in the *intentional* memory the active element is prominent. This is true. But it happens, from this very circumstance, that the passive element is thereby brought into more conspicuous and striking contrast. Indeed, it is often when we are straining our active energies to the utmost to recall, that the power of passive representation, or of spontaneous suggestion, seems to delight to make itself felt, and to assert its independent energy. It would seem to delight to tantalize us by the wantonness of its caprices, as now it flashes those very thoughts upon our mental vision which we are most desirous to hide out of sight, and then as provokingly hides those which we are most desirous to uncover. At one time we are disappointed by a strange and unaccountable forgetfulness of the most familiar objects; at another, we are surprised by the appositeness and the affluence of unexpected thoughts.

The active element prominent.

Must avail itself of the passive element.

The sole and single function which the mind, as active, can exert, is to apply the force of its attention to the object or objects which it is certain have reference to that which is sought for. To these only have we access. These only we have at our command. Energetic and prolonged attention is all which the mind can do at the moment of remembering. It may, indeed, create, compare, infer, etc., and in these ways relieve and assist its attention; but so far as any function proper to simple memory is concerned, it can do nothing more than to hold the object which is in part recovered hard home to the attention, and force the passive soul to represent more of the unknown. We see this is all which it can do at the moment of remembering; for in the origi-

nal act of acquiring or observing, it can do very much toward securing the ready and spontaneous suggestion of the objects of its knowledge when they are required, and to facilitate the activity of the mind in bringing them forth from their hiding-place. This brings us to another class of the facts and laws of the memory, viz., those which relate to the power of retention.

§ 286. Memory is sometimes defined as exclusively the power to retain, or the *conservative faculty*. So Hamilton treats it, and exalts this supposed power into a separate faculty co-ordinate with the power to reproduce and the power to represent. The three are then made equal with the leading faculties of the intellect, as the powers to perceive, to reason, and to judge. But when we inquire for the definition or statement of the function which this so-called retentive faculty performs, we find that no function of the sort is known to consciousness. Indeed, it is conceded by Hamilton, that whatever is done by this faculty is performed unconsciously. We observe still further, that, so far as we are conscious or have reason to infer, there is no proper act or function at all which can be appropriately called the act or function of retention. What we mean when we speak of preserving or retaining an object in the memory, is that the object in question which has previously been known or thought of, can be represented again to the mind, either spontaneously or as the result of an effort, and can then be recognized.

No one holds that, during the interval, the mind acts upon the object, or with respect to it. It does not exert itself to hold it, or concern itself with it in the least. The expression, *to retain*, is purely metaphorical, and simply carries the thoughts over the period that intervenes between the moment when it was first apprehended, and the moment when it is known a second time. As Locke pertinently and truly observes, "This laying up of our ideas in the repository of the memory signifies no more but this, that the mind has a power, in many cases, to revive perceptions which it has once had, with this additional perception annexed to them, that it has had them before. And in this sense it is that our ideas are said to be in our memories, when, indeed, they are actually nowhere; but only there is an ability in the mind, when it will, to revive them again," etc., (B. ii. c. x. § 2).

§ 287. The whole of the so-called power to retain is provided and accounted for under the head of the conditions and laws of representation. We need only assert here that the objects said to be retained are only metaphorically spoken of as preserved in some repository or hiding-place, in drawers, pigeon-holes, or other compartments. Nor can the doctrine be maintained, that in the act of original acquisition the fibres of the brain are disposed in a certain position, which they retain, or at least retain the tendency to reassume. Nor can it be proved, as the followers of Herbart contend, that each object as apprehended, or the state of mind as excited to action by the object, is retained ever afterward in a condition of tension, which, on a fit occasion, springs forth into the presence of the conscious spirit. Now, if all these representations are figurative or metaphorical, the power to retain, or the doctrine of a retentive faculty, must be purely figurative also; the fact which it describes being merely that under certain conditions, and in obedience to certain laws, the mind can represent and recognize its previous knowledge. The mind that can do this in regard to the greatest number of objects, after the lapse of the longest time, is said to have the most retentive memory. *To preserve*, or *retain*, respects both these points—the number of objects, and the interval of time which may have elapsed.

Memory as the power to retain.

The power to retain; how accounted for.

Figurative language concerning the memory.

Ocioso (*De Oratore*, l. 5), Plato, and others, have compared the mind, in preserving what it had known, to a tablet on which characters were impressed or engraved. Notwithstanding the cautious and accurate definition of Locke which we have cited, we find him, in the same chapter, indulging in such language as this: "The pictures drawn in our mind are laid in fading colors, and, if not sometimes refreshed, vanish and disappear." In some, it [the mind] retains the characters drawn on it like marble; in others like freestone; and in others, little better than sand." "We oftentimes find a disease quite strip the mind of all its ideas, and the flames of a fever in a few days calcine all those images to dust and confusion, which seemed to be as lasting as if graven in marble." Again, the ideas are, "very often roused and tumbled out of their dark cells into open daylight by some turbulent and tempestuous passion." Hamilton justly observes, "that of all these sensible resemblances, none is so ingenious as that of Gassendi to the folds of a piece of paper or cloth. 'Concepi charta valeat plicarum innumerabilium, inconfusarumque, et juxta suos ordines, suas series, repetendarum capax. Solloet ubi unam seriem subtilissimarum induxerimus, superinducere licet alias, quæ primam refringant transversum, et in omnem obliquitatem; sed ita tamen, ut, dum novæ plicæ, plicarumque series superinducuntur priores omnes non modo remaneant, verum etiam possint facili negotio excitari, redire, apparere, quatenus una plicæ arrepta, ceteræ, quæ in eadem serie quadam quasi sponte sequantur.'" Gassendi, *Physica*, sec. iii., lib. 3, ch. 3. But Hamilton does not notice wherein the truth and ingenuity of the resemblance mainly lies, viz., the circumstance that the mind, like the cloth, retains nothing but the capacity to assume the same folds and in the same combination and order which it had originally taken.

The ready and the tenacious memory.

§ 288. We observe here, that as the goodness of the memory may respect it as spontaneous or intentional; so we describe it in the one case as *ready*, and in the other as *tenacious*. The one does not exclude the other. If a person is able to recall every object that is required at once, without effort or delay, his memory is called ready; but it is not necessarily implied thereby that he is deficient in the capacity to retain, but only that he is quick and apt to recall. On the other hand, when one is slow to recall, and yet sure to do so by the application of an effort of attention if sufficient time is allowed, his memory is tenacious; by which is intended only that the object is certain to be recovered—not that there is a special capacity to retain, which may be possessed in eminent measure, to which may or may not be added another special capacity to recall.

It frequently happens, indeed, that a person may have a very ready memory, which is at the same time not tenacious; that is, his memory may operate very quickly within a short time, and then forget altogether. It has also been observed, that the susceptible temperament and active nature which qualifies a person readily to recall whatever remembrances are within his possession, is usually not consistent with the exercise of those mental habits which are best adapted to fix remembrances the longest, nor of that patient attention which is sure to bring them back. Hence the inference, that a ready memory cannot also be tenacious. But the examples are very numerous, on the one hand, of persons in whom both these characteristics are most happily and wonderfully combined. To do full justice to these differences, we need to consider the *varieties of memory* (§ 296).

§ 289. The power to *retain*, in the sense explained, implies the power to *lose*, in the same sense; the capacity to *remember*, suggests that there is the liability to *forget*. The fact that we do forget, most men will not venture to question or deny. It is not, however, easy to explain why we forget, or to detail the process by which we lose an acquisition beyond recall. In one aspect of the case, it would seem that we ought never to remember—that the mind might be supposed to be limited to the contemplation of the new objects which the

representative power can bring before it. But when we have become acquainted with the possibility and the conditions of representation, it would seem that we ought to forget nothing, but that it must always be within the reach of every related thought to bring back all its correlates. A moment's reflection, however, must convince us that, were it possible for us to recall every object, the recall could not take place in fact, simply for want of time. To recall the acquisitions of a few years, would require as long a time as to make the original acquirement, even if to represent were our sole occupation; to say nothing of the well-known fact that, to recall in detail under the conditions of association, is a slower process than to acquire under the conditions of sense and consciousness. But it is not solely for lack of time or opportunity that we do not recall. Often, when both are furnished, the related thoughts do not spontaneously present themselves. Often they will not respond when we call them ever so earnestly.

Degrees and varieties of forgetfulness.

The phrase to *forget* is variously employed—sometimes positively, at others comparatively; now absolutely, and then relatively; or, as *Stadenroth* has it, 'Forgetting admits of several degrees, or stadia. The first is a momentary displacement of an object apprehended which is yet certain to spring back as soon as the object displacing it is withdrawn. The second is a comparative withdrawal of the attention, as when we divert our mind from a painful sensation, or, as we say, forget it, in labor or play. The third is when an object will not present itself spontaneously, but we must bethink ourselves in order to recover it. The fourth is when we bethink ourselves in vain. The fifth is when it has vanished for so long a time that we question whether we can by any effort bring it back. The sixth, when we conclude that it is absolutely certain that we shall never recall it again' (*Psychologie*, Berlin, 1824, p. 82).

Is entire forgetfulness possible?

§ 290. It is questioned by many whether this absolute forgetfulness is possible—whether, at least, we are authorized to affirm that the soul can lose beyond recovery any thing which it has known. It is certain that knowledge which has remained out of sight for a long period has often been suddenly recovered. In the excitement of sickness or delirium, in moments of terror or joy, events that had been long unthought of have thronged in upon the memory with the vividness of recent occurrences. A language that had been disused for years, and supposed to be entirely forgotten, has come back to the tongue when the powers were weakened by disease and seemed to be returning to the simplicity of second childhood. Prayers and hymns, the lessons of earliest infancy, though forgotten for all the life since, are repeated at such times fluently and correctly. Even acquisitions that were the least likely to be remembered, and which, previously, were never known or suspected to have been made, come up as though the soul were inspired to receive strange revelations of its capacities and acquirements.

Singular cases of the recovery of forgotten knowledge.

Numerous examples of all these classes of facts have occurred within the observation of the curious, and not a few are recorded in history. The well-known and often-quoted story, which was originally published by Coleridge in his *Biographia Literaria*, is in substance as follows: A servant-girl in

Germany was very ill of nervous fever accompanied with violent delirium. In her excited ravings, she recited long passages from classical and rabbinical writers, which excited the wonder and even terror of all who heard them, the most of whom thought her inspired by a good or evil spirit. Some of the passages which were written down were found to correspond with literal extracts from learned books. When inquiries were made concerning the history of her life, it was found that, several years before, she had lived in the family of an old and learned pastor in the country, who was in the habit of reading aloud favorite passages from the very writers in whose works these extracts were discovered. These sounds, to her unintelligible, were so distinctly impressed upon her memory, that, under the excitement of delirious fever, they were reproduced to her mind and uttered by her tongue.

Rev. Timothy Flint, in his *Recollections*, records of himself, that when prostrate by malarious fever, he repeated aloud long passages from Virgil and Homer which he had never formally committed to memory, and of which, both before and after his illness, he could repeat scarcely a line.

Dr. Rush, in his *Medical Inquiries*, says that he once attended an Italian, who died in New York of yellow fever, who at first spoke English, at a later period of his illness French, and, when near his end, Italian only. He records also that he was informed by a Lutheran clergyman, that old German immigrants whom he attended in their last illness, often prayed in their native tongue, though some of them, he was certain, had not spoken it for many years.

A favorite pupil of the writer, the son of a missionary in Syria, who had spent much of his life in this country, died of yellow fever, and spoke in Arabic—an almost forgotten language—during his last hours.

Dr. Abercrombie tells us that a boy, at the age of four years, received an injury upon the head which made the operation of trepanning necessary. During the operation he was apparently in an unconscious stupor; and after his recovery, it was never recalled to his recollection, till he was fifteen years old, when, in a delirium occasioned by a fever, he gave to his mother a precise account of the whole transaction, describing the persons who were present, their dress, etc., etc., to the minutest particular.

Dependence of
the memory
upon the bodily
condition.

§ 291. Facts like these illustrate the intimate connection of the bodily condition with the phenomena of memory, of which a partial explanation has already been given (§ 244).

They confirm two positions, to which daily experience and observation both testify. The first is, that the extent and reach of our memory is greatly affected by our bodily condition at the time when we acquire. Every object which we apprehend, when in a certain condition of health, we can afterward recall, and this we can do as readily and as easily as we breathe. All the impressions that are received by the soul when thus invigorated by healthful excitement, are spontaneously given back when required. On other occasions, when we are wearied by labor, exhausted by watching, or prostrated by pain, however earnestly we may desire to fix an object in the mind, we can with difficulty secure so as to hold the slightest fragment. The book which we read when in such a mood, the conversation in which we take part, the incidents which happen, become almost a blank to us when we seek to recover them.

Dependence upon
the season
and the time of
the day.

It is in place here to notice the circumstance, that certain parts of the day, and, with some persons, certain seasons of the year, are most favorable to the successful acquisition of possessions for the memory. In the evening, and especially late at night, the attention may seem to be as intently fixed upon

the objects which are to be retained, as in the morning, and the intellectual force may appear to be more energetic. There is often, however, an accompanying over-excitement of the nervous system, a fever of the brain, which either distracts the attention, or, if it seems to fix it for the instant with greater energy, hurries it so rapidly from one object to another, as not to allow that serene and continuous mental effort which is required for successful retention. Sometimes it happens that the acquisitions of the previous evening, which seemed to be so distinct and promised to be so permanent, have well-nigh vanished in the morning, and require to be reviewed to be made useful or sure. It is easy to see how, after the analogies furnished by these phenomena, can be explained the frequently evanescent character of the acquisitions which are made under the influence of wine or opium, as also the fact that the men of the strongest memories have often been either water-drinkers, or men of *strong heads*, not easily disturbed by stimulants.

§ 292. The second position is, that, whether we can recall what we may be said to have acquired, depends also very largely—at times altogether—upon the bodily condition at the moment of our desire or effort to remember. Under the inspiration of joyous health or the stimulus of exciting disease, all that we have ever experienced, witnessed, or learned, comes back to us as if a good genius were pouring forth at our bidding all that we need or desire to recall. Again, in seasons of extreme weakness, we cannot recover the most familiar names, incidents, or dates, and our most common knowledge refuses to serve us. Persons who have fallen from a height, or have but just escaped death by drowning, tell us of the wonderful activity of the memory during the brief period of consciousness—of the incredible number of persons and events which they recalled, and the comprehensive sweep of the eye, by which, as at a glance, they revived the pictured memories of their life.

It is pertinent here to refer to the many cases of the sudden and almost entire loss of memory, some of which are as striking as those of its development to unwonted energy. A lady of superior endowments and culture was for several days exposed to suffering and fear, in a storm at sea which terminated in the wreck of the vessel. A severe and protracted illness was the consequence, from which she slowly recovered. After her apparent restoration to complete health, it was found that the best part of her acquired knowledge was gone, and it was never afterward recovered. An attack of apoplexy has been said to efface all remembrance of the events of some definite period of the life. Sometimes paralysis greatly weakens the capacity to remember names and dates. Rev. William Tennent, a distinguished American clergyman, while preparing for college, was taken sick, and was, for a time, supposed to be dead. During his recovery, it was found that he had lost all that he had previously learned, and even his memory of the alphabet. On a sudden he complained of a violent pain in the head, and instantly found himself restored to his normal condition, and the master of all that he had previously known.

§ 293. Both classes of facts—those which illustrate the dependence on certain bodily conditions of both the power to acquire with effect the materials for the memory, and the power to recover them with ease—can be accounted for by the general views already expressed. The varying condition of the body through the

Dependence on the condition of the body in the act of recalling.

Sudden loss of memory.

How these cases are explained.

several sensations of which it is the occasion, enters into the experiences of consciousness, and furnishes a most important element in them all. It is the constant background on which all the mental activities are projected, the never-failing setting with which every one of them must be accompanied. When these sensations are of a certain description, they are the normal and favoring accessories of the other actings of the soul; helping, not hindering, the exertion of the higher energies, and presenting objects with which these are all happily united. If they are abnormal, disturbed, or unpleasant, the mind is so absorbed or distracted by the presence of these obtrusive sensations, that it has little energy to spare for other objects, and no capacity to steady the attention upon them. In these ways we may suppose certain bodily states to be unfavorable to successful acquisition.

Again, the bodily condition may also present sensations which so far disturb and distract the attention, as to allow no time for the passive memory to respond to any call; may so hurry the mind from one object of present sense-experience to another, as to leave no opportunity for the representing power to thrust in a single mental image; or, on the other hand, these sensations may be so utterly dissimilar to any which have been before experienced, as to suggest no image of the past. Or again, this complex of sensations may be most favorable to the easy and almost exclusive action of the passive or spontaneous memory, and may be so akin to the states which we would recall, as to be all luminous and living with objects that suggest those which we welcome or seek after. In such cases, the body itself becomes an ethereal minister to the soul—almost an airy vehicle of spiritual life and energy.

May all knowledge be recovered?

To the question, whether the circumstances of the soul can ever so far be changed as to empower it to recover all the past, the analogies suggested by these facts would lead us to reply: (1.) Under no circumstances whatever can it be supposed that the soul shall recover what it has not in some sense made its own by the energetic action of its attentive consideration. That is not a proper object of memory to the soul, which has not been taken up into its life by its efficient acquisition. (2.) It is supposable that the conditions might be furnished of recalling all the past thus defined, under the actings of laws which are well known to us. We have only to suppose that a vehicle or subject of the proper psychical experiences—call them sensations, if you will, and the occasion of them a new body—should be furnished, and these would of themselves give back every element of past acquisition or experience to which they are attached.

Varieties of memory: how explained.

§ 294. With the progress and development of the powers and activities of the soul, the memory itself advances through separate stages, each of which prepares the way for that which follows, and occupies the place of its natural and logical condition. The memory of the infant differs from the memory of the child; the memory of the child differs from that of the youth; the memory of the man, in each of the several stages of active life, differs from that in the stage which succeeds it. In general, the memory of the person in active life

differs from the memory of old age. This must necessarily follow from the very nature of memory when considered as to the materials on which it works, and the laws by which it acts. The memory of an individual can rise no higher than the intellectual and emotional life which furnish the objects which it has to recall. It can take no other direction than that which is indicated by the relations and connections in which these objects are habitually combined. As these objects and relations stand to all men in a certain common order of preparation and evolution, there must consequently be a certain similarity in the order of the stages through which the memory of all is evolved. As there are also special classes of objects and relations that are proper to different classes of men, arising from their peculiar employments and habits of thinking and feeling, each of these classes has a memory that is peculiar to itself. The memory of the artist is very unlike the memory of the mathematician. The memory of the erudite and disciplined thinker differs greatly in its objects and its laws, from the memory of the person who has had little culture from reading or thought. Hence, there exist many clearly distinguishable *varieties* of memory, if we make nothing of the fact that every individual must have a type of memory which arises from those individual habits of thought and feeling which he can share with no other person.

Development of
memory. The
memory of in-
fancy.

§ 295. The attention of the infant is at first occupied with the sensible world. It sees colors that delight the eye, it hears sounds that captivate the ear. It is long before it unites these separate percepts into individual objects, and still longer before it discriminates, by special attention, one object from another. Later still, it learns to notice with any effect its own inner experiences and activities. Then, it must learn distinctly to apprehend both object and activity as referable to itself as their agent and subject. It requires still more reflective attention before the mental activities and the mental objects are arranged as before and after, and the relations of time can be familiarly applied. The relations of here and there are of still later evolution. But all these separate elements must be familiarized by attention before an act of memory can be at all definite and complete, inasmuch as, whatever suggestions of representation there may be, there can be no proper act of memory till all these elements are recognized.

Even when memory becomes possible to the infant, it is evident that the memory does not go beyond the attention, whether in respect to the objects which are recalled, or the mode in which they are viewed. The germinant memory of the infant must be exceedingly limited, because its materials are very scanty; the chief force of its intellectual life being expended in acquiring rather than in recalling. So far as it remembers at all, its memory is passive, being completely directed and controlled by the persons and things which it encounters, and recalling only the objects and feelings which their presence suggests. Intentional memory is as yet undeveloped, for the infant is the passive child of nature, the stream of its memory running side by side with the course of its objective life. The infant remembers, as animals remember, just that, and only that, which the objects of sense-perception recall to their thoughts. It does not cut itself off from the objective world even by a reverie. It exercises only the lowest form of passive representation—that which depends entirely on the sense-perceptions.

The memory of
childhood and
youth.

§ 296. The acquisition and use of language opens the way for the higher memory, though obviously in its first beginnings. The right use of words, and of short sentences, requires that the child should connect names with distinctly discerned objects, and that it express its wishes and thoughts by

short sentences. Both processes imply memory; but so long as the object perceived, or the thought recalled, suggests the word and sentence, the style and range of memory are limited and low. But by-and-by the child finds that it forgets—that it has not the knowledge which it once possessed. It cannot recall the right name or phrase which it wishes to use, and which it knows it has previously spoken. It is impelled by its wishes to recall the forgotten object, and begins to practise the arts of the intentional, or active memory. But these occasions and efforts are at best so infrequent, and of so little importance, that they train the intentional memory only to a slight degree. It is by tasks imposed by others directly and indirectly, that the soul is disciplined to the exercise of this higher memory, and that the power itself is developed. The child is taught written language. It learns the alphabet and spelling by the eye, or brief sentences and verses by the ear. To master these tasks, it must enforce its attention and employ repetition by continuous efforts, and for a longer time than has been its wont, upon objects which of themselves present few attractions and excite but little interest. By these efforts the capacity is developed to regulate and direct the spontaneous memory to special results—by fixing certain objects for recall, by concentrating the attention on certain objects to the exclusion of others, until they are placed at the service of the soul. Children are charged also with commissions to execute, with services of labor or courtesy which may not be forgotten, and with endless lessons from books to prepare and repeat.

§ 297. By degrees, this pupil of others becomes his own taskmaster: he passes from the lower discipline of the memory, which others enforce, to the higher, which he imposes upon himself. The intentional memory, which has been trained by others, he cultivates for himself. He makes his own purposes; he proposes his own ideals; he knows what he must learn in order to accomplish these purposes and to realize these ideals; he appoints to himself his own lessons; tasks his own intellect to consider, and his own efforts to retain what he foresees he shall have occasion to know and to have at command. He must be able to remember this or that, in order to gain a livelihood, to acquire wealth, to maintain a decent position in society, to attain success or eminence in his business or profession, to shine in conversation, to achieve reputation or usefulness as a writer or speaker. These objects are desirable, and upon the attainment of one or more the purposes are fixed. Because the end is desired, the means are first tolerated and then loved, till the acquisition of the driest details and the most uninteresting particulars has become the habit of the man; and the memory can be applied and directed to the possession of any species of knowledge which is necessary for its chosen purposes. In passing from childhood through youth to early manhood, every person is forced to become familiar with those objects and relations which have a necessary or intimate relation to his occupations and duties. According as this training of his attention is more or less complete, so does his memory become more or less perfectly subject to his control, and from the passive spontaneity of early life passes into the active energy of mature years.

§ 298. This memory of manhood is also characterized by the predominance of thought-relations and of rational purposes. The spontaneous memory of early life is not thereby displaced; the original aptitudes of the memory of both eye and ear are not necessarily set aside. They may be rendered more efficient as they are aided by the new relations with which thought and reason invest their objects. But just so far as one thinks and acts like a man, just so far will he remember as a man, and not merely as a child—that is, by the aid of those higher relations which thought requires, and which definite aims and rational activities necessarily involve. The memory of the man is not only intentional, but it is also *rational*.

§ 299. When the man advances from the busy noon toward the quiet evening of life, his exclusive interest in the objects which have absorbed him in manhood is relaxed, either through physical infirmity, or the success which satiates, and perhaps the disappointment which wearies a man with life. Or it may be, that through the salutary discipline of experience, he reverts to the simpler tastes

and the purer affections of earlier years, or looks forward to the higher objects which dawn upon him from the life beyond. The news, the markets, the politics, the literature, the society that occupied his attention so exclusively, are now less attended to, because they are less cared for. In place of an intent and absorbed devotedness to the present, there is a more frequent review of the past. Old scenes are described, old books are read, old companions are talked of, old stories are repeated. The best energies of the mind are given to these objects, while the mind scarcely heeds, or with enfeebled interest, the scenes, the persons, and events that are present. For this reason, recent objects are so readily forgotten, and the singular contrast is furnished in the memory peculiar to the aged—most tenacious of objects and events that occurred longest ago, and readily forgetful, if forgetful at all, of those that were most recent.

Special and individual varieties of memory.

§ 300. Besides those varieties of memory which are common to all men in the successive periods of their life, there are the special peculiarities which result from one's pursuit or profession. The historian remembers facts and dates; the philosopher, principles and laws. The artist remembers landscapes and faces; the wit and the story-teller, never forget a successful jest or a capital anecdote. These habits of memory, as they are called, often grow stronger till they become fixed beyond the power of change. They often result in a one-sidedness of intellectual character that may be exaggerated into a serious and unnatural defect. Persons distinguished for great intellectual power in certain directions, very often complain of a serious defect of memory which they cannot account for. Such one-sided habits and defects are not peculiar to the memory only, but pertain equally to all the activities of the soul. The condition of memory is energy in the original activities; these involve attention to the objects to be remembered. Attention springs from an active interest in these objects. This prevailing interest follows the habits which constitute and express the character.

The reason why, of the same story the historian remembers the facts and dates, the philosopher the principle or the moral, and the wit its humor, is that each is prepared, by his previous habits, to be intent upon and attend to a special class of objects. Each selects out of this common material the elements for which he has affinity, and, as by the force of an instinct, quietly appropriates this, and this only. He finds what he seeks, and seeks what he finds; and what he seeks and finds, he retains and recalls. Man cannot be said to *have* a memory so much as to repeat in his memory the life which he actually lives.

The growing feebleness or failure of memory, by which many are disturbed, is often only an indication of a change in the direction of the intellectual activities incident to the progress of years, or to a change in one's pursuits or studies, or to a revolution in one's tastes and character.

Varities of memory depend on objects and their relations.

§ 301. We return again to the fact that these varieties of memory are not only distinguished by the character of the objects remembered, but also by the method and relations under which they are recalled. The things which the child remembers not only differ from those which an older person recalls, but they are recalled in a child's order, and by the relations which are proper to a child. The same is true of the devotee to any study or pursuit so far as

special intellectual habits are induced by such a study or employment. When the child recalls to itself or recites to others a series of incidents of which it has had experience, it depicts the whole, generally in the order of time, with little selection of materials according to their importance or their relation to any principle or purpose. The spontaneous memory of the eye or the ear, reproduces the past solely after the relations of time or place, with no rearrangement or selection of the same such as would be suggested by the desire for the clearer apprehension of the hearer, or by the bearings of the story upon his intellect or his feelings.

The memory of the undisciplined mind. This is very conspicuous in the memory, and especially in the narratives of uneducated persons. Thus, Dame Quickly recites the story of her wrongs in the following fashion: "Thou didst swear to me upon a parcel-gilt goblet, sitting in my dolphin chamber, at the round table, by a sea-coal fire, upon Wednesday in Whitsun-week, when the prince broke thy head for liking his father to a singing-man of Windsor; thou didst swear to me then, as I was washing thy wound, to marry me, and make me my lady thy wife" (Henry IV., 2d part, Act II. scene i.; cf. S. T. Coleridge, *The Friend*, Sec. II. *Essay* IV.) No finer opportunity is furnished for observing this variety in the order and method which characterize the memory of different persons, than in listening to the testimony of different witnesses in a court of justice, concerning the same transaction. One witness tells a long and rambling story, which follows the order of his own observations in time, and recites the most trifling accompaniments of place and circumstances. Another recounts those only which are material to the object for which he gives testimony. In each, can be observed an order of association peculiar to himself, by which the circumstances suggest one another, and according to which the details are presented. The laws which prevail in the memory of each, the presence of the higher or the predominance of the lower relations, are often in this way strikingly illustrated. The self-possession of the narrator, and his previous discipline in the art of communication, may have much to do with the method in which the stories are told; but the mechanical or the rational memory will show themselves, and cannot be kept out of view by any arts of speech or force of effrontery.

The memory of the young and of older persons. § 302. The memory of the young is usually more ready; that of the adult is more tenacious. This is, in part, owing to the greater physical vivacity of youth, which gives a character of greater readiness to all its movements. The vivacious old man is as quick to remember as he is to apprehend or judge; while the torpid and phlegmatic child is as slow in his memory he is as in his reasonings and inferences. The difference, however, is not a difference of temperament or animal spirits, but has its ground in the character of the relations which predominate at each of these periods of life, and which affect the memory as truly as the other functions of the intellect. Objects that are recalled by the relations of space and time and of obvious resemblance, present themselves promptly, if they are remembered at all; but these relations are, from their very nature, limited to but few individual objects. Hence, the groups which are connected by such relations are sooner set aside and forgotten, and are, in their turn, displaced by others. The relations of thought, however, especially those which are founded on wide-reaching principles or laws, are in their very

nature less obvious. As the mind requires longer time to discern such relations, so it does not recall single objects as readily as by those relations which are less general. But, on the other hand, the principles themselves are few, and are constantly before the mind. When these are once mastered, they are illustrated in every fact; they are exemplified in every instance. By means of them we can prophesy and construct the future as well as explain and interpret the past. These few bonds of association, when they control the memory, give to it perfect security in and command over its possessions.

It is a beneficent arrangement which provides that the spontaneous and inferior memory, which is first developed in childhood and youth, should be more quick in its activities, so as to be readily adjusted to new scenes and new objects, and yet less tenacious, because so much which it acquires has only a temporary value and application. There is a reason why the higher memory should be more circumspect and slow, inasmuch as it suits the occasions of life which imply quiet and deliberate thought, while, at the same time, it is more tenacious, because it concerns itself with principles and relations, which can never cease to be interesting and useful—which can never be displaced, and can never be exhausted.

The men of universal memory: Niebuhr and Pascal.

§ 303. The men of universal memory are those who combine most happily the ready memory of facts and events with the tenacious memory of truths and laws. They are those whose spontaneous memory is not displaced, but rather aided by the development of the rational memory which sees in facts the illustrations of the higher relations of philosophic truth. They are those who enliven abstract truths by the examples of particular facts, and who give meaning and dignity to the memory of facts by means of their relations to principles. They are those who hold fast the acquisitions of youth and of old age by the permanence of principles which are as old as the universe and as new as the latest experiment by which they are verified.

Of the memory of *Niebuhr*, Prof. U. A. Brandis, of the University of Bonn, who was his intimate friend, gives the following description; "A more comprehensive and trustworthy memory, or greater control over it, can scarcely have been possessed by Joseph Scaliger, and other heroes of mnemonics; it certainly was never combined with clearer powers of reflection. *Niebuhr* was a close observer, and found some connecting link between all the manifold external and internal perceptions which came before him; hence he mastered languages and sciences, signs and the things signified, with equal ease and with such certainty, that with the mind's eye he saw each in its own individuality, separate from its fellows, and yet intimately and variously related to them It [his memory] was equally retentive of perceptions and thoughts, of views and feelings, of sights and sounds; whatever came within the sphere of his recognition, took up its due relative position in his mind with equal certainty and precision." (*The Life and Letters of Barthold Georg Niebuhr*, etc., etc., Appendix.)

"'Tis reported of that prodigy of parts, Monsieur Pascal, that, till the decay of his health had impaired his memory, he forgot nothing of what he had done, read, or thought in any part of his rational age." (Locke, *Essay*, B. II. c. x. § 9.)

The memory of the ancients.

§ 304. The memory of the ancients, if we may believe all the stories which are told of the achievements of some of their more distinguished men, surpassed, in some respects, the average attainments of the moderns. It is not difficult to believe this to have been true, from what we know of the memory of those who most resemble them in the circumstances of their lives, and the discipline of their intellects. Their attention was far less distracted by a variety of objects than is the

case with the moderns. The facts in science, literature, chronology, and history, which they were required to remember were far fewer than those which burden the memory of the modern scholar. More than all, they relied far less than we do upon writing, memoranda, and books, to preserve what they desired to retain. They committed their acquisitions to their own power to recall them. Conversation and repetition were practised far more generally by them than by us. What was heard by the ear from the living teacher, was repeated and discoursed of by his interested scholars, till it became a part of their very being. The oft-repeated chronicle which the patriarch recited to his reverent descendants, was caught and recounted at once by his hearers. The ode or epic that was chanted by the bard before the entranced assembly, was sung over again, in parts or as a whole, as soon as he finished it. His exciting words rung in their ears till they were uttered by their tongues. We can hardly conceive of the strength and reach of memory in a community in which conversation took the place of writing, and recitation performed the service of the printing-press, especially if the community consisted of men of powerful intellects, intense feelings, and energetic wills.

§ 305. The methods of education should be conducted with a distinct recognition of the wise arrangements of nature in developing and maturing the memory. In the earlier periods of life the spontaneous memory should be stimulated and enriched by appropriate studies. The child should learn

The laws of memory should be regarded in education. stories, verses, poems, facts, and dates, as freely and as accurately as it can be made to respond to such tasks. During this early and objective period, it should learn as many languages as is possible in the circumstances, or as is desirable for its future pursuits. Especially should it learn those languages which can be taught in conversation, or acquired by contact with those who speak them freely and well. If the elements of the ancient languages are taught so early in life, they should be taught, so far as in the nature of the case is possible, by similar methods. But as the higher and rational powers awake to action, every acquisition that has been made after the lower and more obvious relations, should be secured against loss by recasting it and relearning it as it were, after the relations which are higher and more philosophical. English children who learn to speak French, German, or Italian fluently in early life, may lose their acquisitions almost entirely, unless these are fixed by a grammatical study of these very languages at a somewhat later period. The large accumulations of facts and dates, as in geography and history, which are made very early by many carefully-trained children, and with the greatest ease on their part, are liable to be effaced, and, as it were, swept clean out from the memory, unless they are secured against loss by reviewing and rearranging them under the new and higher relations which the development of the reason makes possible.

On the other hand, to anticipate the development of the reflecting powers, by forcing upon the intellect studies which imply and require these capacities, is to commit the double error of misusing the time which is especially appropriate to simple acquisition, and of constraining the intellect to efforts which are untimely and unnatural. The modern practice of occupying the minds of children with the reasons of things, *i. e.*, with laws, principles, etc., in the forms of compends of astronomy, of natural or mental philosophy, natural theology, etc.—is one that cannot be too earnestly deprecated, or too soon abandoned by those who would train the mind according to the methods of nature, or adapt its studies and pursuits to the order in which its powers and functions were intended to be evolved (*cf.* § 61).

§ 306. The cultivation of the memory is a subject which has been earnestly discussed by many writers, and is of practical interest to all those who are bent on self-improvement, or are devoted to the education of others. Many complain of a general defect of memory. Others are especially sensible of painful failures in respect to certain classes of objects, as names, dates, facts of history, sentences or passages from authors familiarly read. The question

How can the memory be cultivated?

is often anxiously propounded, How can these general or special defects be overcome?

Fundamental principles and rules. The conclusions which we have reached in respect to the nature and laws of memory, suggest the only practical rules which can be attained. These rules may be summed up in the following comprehensive directions: 'To remember any thing, you must attend to it; and in order to attend, you must either find or create an interest in the objects to be attended to. This interest must, if possible, be felt in the objects themselves, as directly related to your own wishes, feelings, and purposes, and not to some remote end on account of which you desire to make the acquisition.' For this reason, in entering upon a new study or course of reading, it is often essential to feel that the knowledge which they will give is necessary for ourselves, so that we may be eager to satisfy our minds upon the points which are involved, and may receive what is furnished, with freshness and zest. It should never be forgotten, that in memory, what is reproduced is not the object as such, or the object in itself, but the object as apprehended and reacted on by the soul. In other words, the soul can recall no more than it makes its own—no more than, in acquiring, it constructs or creates as a spiritual product by its own activity.

Even the extraordinary feats of the spontaneous memory are chiefly to be accounted for by the fact that the soul can give its whole energy to words or sounds, as in the memory of the ear, and to forms and colors, as in that of the eye, and can shape them into wholes by rapid combination under the relations of time or space. Defects in the power to do either, whether it is viewed as an original endowment, or as a habit acquired in the very earliest periods of life, lie chiefly in an incapacity to attend to and connect together sounds or sights. Whether it is because the soul is deficient in general energy, or in special sensibility of the sentient eye or ear, or whether because it has early contracted some untimely habit of absent-mindedness or abstraction, which withdraws its energy from the objects of sense and their relations, it is a simple fact, that the man does not remember because he does not attend to, and by his attention, connect the right objects under these simplest relations. It may be impossible completely to overcome such a defect as this by any art or discipline. Repetition is the specific remedy, because it holds the attention and draws in the wandering and often the wool-gathering intellect from its aimless roving. This must be enforced with unsparing rigor. 'Read every sentence while holding your breath,' says a lively writer; meaning, by this, Throw your whole soul into every act. If he had added, Pause when you have finished it, and take another breath while you review it, he would have explained the whole secret of successful and permanent acquisition of every kind, whether of facts or their relations. Were this rule invariably followed, the mind would act with energy in all that it does, and would also be detained in every act long enough to receive permanent impressions, whether in the way of facts or relations. Whatever objects are thus taken up into the mind—or perhaps we should say, to whatever objects the mind imparts its own living power—cannot easily be forgotten.

The late Sir Thomas Fowell Buxton advises his sons in the following golden words: "What you do know, know thoroughly. There are few instances in modern times of a rise equal to that of Sir Edward Sugden. After one of the Weymouth elections, I was shut up with him in a carriage for twenty-four hours. I ventured to ask him, What was the secret of his success; his answer was: 'I resolved, when beginning to read law, to make every thing I acquired perfectly my own, and never to go to a second thing

all I had entirely accomplished the first. Many of my competitors read as much in a day as I read in a week ; but, at the end of twelve months, my knowledge was as fresh as on the day it was acquired, while theirs had glided away from their recollection." (*Memoirs of Sir Thomas F. Buxton*, chap. xxiv.)

Artificial memory, or mnemonics. § 307. Numerous devices have been contrived in order to aid the mind so to make its acquisitions as to secure them against loss, and to bring them readily to hand when required. They were not unknown to the ancients, as is evident from Cicero, *De Or.* ii. 86-88 ; *Ad Herenn.* iii. 16-24 ; Quint. *Instit.* x. 1, 11-26. They all rest upon a common assumption or principle, viz., that it is possible, by means of arbitrary associations, so to connect what one desires to remember with a series or scheme of objects, artificially arranged or actually existing, that they can be readily and certainly suggested to the mind. Some teachers of mnemonics employ a scheme of geometrical figures, as squares or triangles. For example: if a person, in listening to a discourse or lecture, should, as the speaker proceeds, connect the leading thoughts or divisions with the panes of glass in a window-sash, or the panels of a door, he would avail himself of the geometrical method, which addresses the eye, through the space-relations of visible objects. Often these systems have sought to aid the memory of dates, through the letters of the alphabet ; each representing some number, and being capable of forming artificial syllables, which can be readily attached to names of persons or places distinguished in history. For example: you could fix in your memory the date of Napoleon's birth by such appropriate syllables indicating the birth and the date together as should form the artificial word *Napoleonitism*. To the use of such an expedient it is objected, that, though it might serve in the few cases in which novelty should lend interest to the effort and the subject-matter, yet the task of modifying every name and event, and then learning the barbarous terms thus forged, would necessarily become uninteresting and onerous. To avoid this objection, mnemonic verses and tables have been furnished for many of the important objects with which every student is expected to be familiar, as the names of the sovereigns of the great kingdoms and empires, grammatical paradigms and rules, logical formulæ, etc., etc.

Value of mnemonics. A correct estimate of the value of all artificial memory may be summed up as follows: The natural, as opposed to the artificial memory, depends on the relations of sense and the relations of thought; the spontaneous memory of the eye and the ear availing itself of the obvious conjunctions of objects which are furnished by space and time, and the rational memory, of those higher combinations which the rational faculties superinduce upon these lower. So far as the mind is intensified in the energy of its attention, through the interest which the consideration of either of these classes of relations excites, so far is the natural memory susceptible of cultivation and improvement. The artificial memory proposes to substitute for the natural and necessary relations under which all objects must present and arrange themselves, an entirely new set of relations that are purely arbitrary and mechanical, which are devised for no other object, and excite little or no other interest than that they are to aid us in remembering.

Objections to mnemonics. It follows that, if the mind tasks itself to the special effort of considering objects under these artificial relations, it will give less attention to those which have a direct and legitimate interest for itself. Its energies, instead of following in easy obedience the leadings of nature, will be forced to exertions that are constrained and artificial. Whatever dexterity is acquired by these intellectual gymnastics, must be gained at the expense of that rhythmical power which always rewards those exertions in which art follows nature. The wonderful feats of memory which are occasionally adduced as resulting from the latest new device in mnemonics, are the fruits of much time, labor, and enthusiasm. Had the same time, labor, and enthusiasm been expended in acquiring knowledge by means of the ordinary appliances, the acquisitions would have been many times more valuable for the culture of the powers and the uses of life. Perhaps even the number of facts recorded in the memory would have been as numerous.

There are occasions when the artificial memory is unquestionably useful. It may serve a good purpose in holding before the mind facts which it is important to remember when neither the facts themselves, nor their relations, present attractions which are strong enough to fix or hold the attention. Thus, it is often convenient and sometimes necessary to learn a list of names, a succession of dates, a system of nomenclature, and the declensions, genders, paradigms, etc., of the words of a strange language. To the child, such tasks imply no special difficulty; the spontaneous memory of the eye and the ear can master them as easily under one set of relations as another. But for the man whose intellectual force and interest are preoccupied, it is often difficult to apply the memory with success to such objects, unless they are arranged in some novel relations. The artificial memory comes to his aid, and offers the service and assistance of art to supplement the failing forces of nature; to reinforce, and, as it were, to renew the spontaneous memory by novel appliances.

One of the most ingenious and successful examples of the application of artificial memory, is furnished in the plan for studying history and chronology, which was devised by the distinguished Polish General Bem, and adopted in the secondary schools of France. It has also received some favor in this country. Its professed design is to hold the mind of the learner in active occupation upon each leading event, name, date, etc., so long that it will not be easy to forget it. He is also compelled to view each in its relative order and importance. These objects are accomplished by means of a series of skeleton charts, the several divisions of which are colored by the pupil himself, after the large chart from which the teacher dictates and lectures; each lecture being afterwards recited by the pupil. A thorough course of historical studies pursued after this method must require much time, frequent repetition, and almost exclusive attention. (Cf. E. P. Peabody. *Universal History arranged to Illustrate Bem's Chart of Chronology*, Chap. vii.)

Coleridge's arts of memory.

§ 308. But while we concede a certain advantage to the artificial memory under circumstances like these, we must still hold, with Coleridge (*Biog. Literaria*, chap. vii.), that, for the ordinary uses of the student, *sound logic*, a *healthy digestion*, and a *quiet conscience* are the proper conditions or arts of memory.

By *sound logic*, is, of course, intended a well-balanced and well-trained intellect, which by original structure and that self-mastery which training imparts and implies, is capable of fixed attention, clear apprehension, and excited interest. Without these conditions, a strong and trustworthy memory is impossible.

A *healthy digestion* is also requisite; for if the digestion is disturbed, the action of the mind will be distracted by those vague sensations of depression and discomfort which are inconsistent with that harmonious interaction of the powers of the whole man, which is indispensable to a good memory. Even though it happens that persons in this condition are capable of extraordinary energy in their mental efforts, yet these occasions are certain to be followed by longer periods of listlessness and depression which exclude that frequent and comfortable repetition and review of the knowledge which are quite as essential as energy and interest at the time of the original acquisition. It is in place here to refer again to the disturbing influence upon the memory of the use of opium and intoxicating liquors. Both these agents, and all narcotics and stimulants in excess, disturb the normal condition of the sensorium, so as to preclude the steady

attention, the cool and calm judgment, and the quiet reflection which are essential to a well-working memory.

A *clear* or *quiet conscience* is also a prime requisite, for a similar reason. Indigestion and intoxication of any kind disturb the memory, by intrusive, uncomfortable and exciting sensations. But the consciousness of guilt haunts the spirit with disquieting self-reproach, and a vague or defined fear of deserved punishment. Feelings of this sort do indeed often stamp upon the memory certain impressions that are ineffaceable. But for this very reason it is the more unfitted to attend with interest or enthusiasm to other objects, and its movements in all directions are benumbed or depressed by distraction or constraint.

The entire passage from Coleridge is a summary of valuable truth. "Sound logic, as the habitual subordination of the individual to the species, and of the species to the genus; a philosophical knowledge of facts under the relation of cause and effect; a cheerful and communicative temper, that disposes us to notice the similarities and contrasts of things, that we may be able to illustrate the one by the other; a quiet conscience, a condition free from anxieties; sound health, and above all (as far as relates to passive remembrance), a healthy digestion; these are the best—these are the only *ARTS OF MEMORY*." (*Biog. Literaria*, chap. vii.)

The moral elements of a good memory.

§ 309. It is natural, in this connection, to notice the moral conditions of a good memory. The man who would have a strong and trustworthy memory, must always be true to it in his dealings with himself and with other men. He must paint to his own imagination, with scrupulous fidelity, whatever he has witnessed or experienced. He must never so yield to the bias of interest or passion, as to strive to persuade himself, even for a moment, that events were different from what he knows they actually were. He must seek to repeat to others the precise words of what he has heard or read, whenever he makes communications by language. Such a moral discipline to internal and external honesty, both implies and enforces a mental discipline to earnest and wide-reaching attention—an attention which does complete justice to every object that comes before it, and which neither slights nor omits any thing which ought to be brought to view. An intellect that is regulated and neld to its duties by the tension of such a purpose, will act with the precision and certainty of clock-work. Its recollections will be trusted by others, because they are trusted by the person himself, and for the best of reasons—because he is true to what he remembers.

How to destroy and confound the memory.

On the other hand, a person who is false to his fellow-men, will often weaken his confidence in his own intellect, and may end with an incapacity to distinguish falsehood from the truth. What he does not like to remember, he will persuade himself did not actually happen, or, at least, not in every particular as it spontaneously presents itself to his view. At first he dares not deal falsely with the record by wilful denial. He simply refrains from giving to it an open-eyed and fixed attention, and by degrees allows in himself careless and inattentive habits of recalling the whole truth. Then follows, by natural consequence, distrust of his own memory, because he is not sure that the materials are at hand with which he can correct his own omissions. The next step is, under the excitement of strong passion, to persuade himself that what he desires should be true, and

really occur, or was really written or said. If he asserts this by his own word, he is the more strongly committed to believe it. At last, he becomes so false to the workings of his own memory, that he dares not trust it himself. Under the constant excitements of passion and prevailing selfishness, his memory and imagination are confounded together, so that the man himself cannot trace the line which divides the two. The appropriate functions of the memory come to be distrusted, and the memory itself is almost obliterated.

It is well to remember, that, while the liar has more pressing need of a good memory than any other man, he is of all men the least likely to possess it.

CHAPTER V.

REPRESENTATION.—(2) THE PHANTASY, OR IMAGING POWER.

From perfect memory, we pass (§ 274) through the several forms and degrees of imperfect memory till we come to *the phantasy*. In other words, from representation *with* recognition, we proceed to representation *without* recognition. The phantasy is conspicuous in *reverie*, *dreaming*, *somnambulism*, and *insanity*. In all these varied forms of manifestation, it presents some of the most difficult as well as the most interesting problems for the student of the soul and the intellect of man.

Phantasy defined and illustrated.

§ 310. The phantasy, or imaging power, is that form of representation which brings before the mind's apprehension objects, or, more exactly, images, *as such*, severed from all relations of place, time, or previous cognition. The best example of the exercise of this power is furnished in dreaming. In this state, the mind is the passive subject and observer of the images that throng in upon it, with no recognition of their having been previously known. In what are called the abnormal or disordered states of the soul—as somnambulism, and the various types and degrees of insanity—the phantasy has a more or less complete control. Its images and pictures are so far from being remembered as past, that they are believed to be present realities.

Reverie. Infancy. Old age.

Among the wakeful and normal states of the soul, reverie is the purest and the most perfect instance of phantasy. In this condition, the workings of the phantasy are more or less pure, according as the mind is more or less completely given up to the passive contemplation of the pictures that pass rapidly before its view. The fewer the relations to the past or the present which they suggest, the more complete is the working of the phantasy. The more free it is from any attendant sense-perceptions or from any remembrances to which these pictures tend, or from any operations of thought, the more entire is the dominion of simple phantasy. In earliest infancy this power may be supposed to be active, for the reason that the mind has not yet reached a condition in which memory proper is possible. As soon, however, as the mind has perceived distinct and separate objects, it has materials which it

can represent simply as pictures, even before it has perceived them under those relations of place, time, and its own experience which are essential to memory. In extreme old age also, when the incapacity to attend to single objects for a long continuance precludes intelligent and effective perception, memory, or thought, the phantasy may still survive, and actively call up the pictures of the past, simply as pictures, each recalling the next, according to the conditions and laws already explained.

Why phantasy infrequent. Trains of association. In the wakeful and earnest periods of the mind's activity, the exercise of simple phantasy is precluded, for the obvious reason, that at such times the mind is intent upon some rational object, which lifts it above the condition of the passive reciplence or contemplation of pictures. What would otherwise be pictures only, become remembrances; or they are shaped by imagination into orderly and rational creations, for the ends of amusement and instruction; or they are subjected to the uses of thought in classification, reasoning, invention, and discovery. And yet, with such activities, there are not infrequently mingled those approaching to pure phantasy. When one object suggests another in a train of associations, many may be recalled without a single distinct act of remembrance, and yet every one may be a transcript from some reality experienced in the past. Each is recalled, however, not as a remembered or recognized object, but as an image of simple phantasy. Indeed, in every such train of rapid association through which the mind proceeds in its eager quest of some object or end earnestly sought for, innumerable such pictures must present themselves in rapid succession. Whatever the mind may have permanently acquired—as a face, a landscape, a taste, a sound, the voice or step of a friend, a musical air—may come back as a *phantasm*, or image. Of many of these objects it is true, that if the mind dwells upon them, they may be remembered as well as pictured; but if they simply flit before the eye of the mind, each suggesting the other, their presentation and observation is the work of the phantasy alone. This power is exercised far more frequently than we notice, for the reason that it is mingled with the exercise of the higher powers, while these last, and their results, occupy our chief energy and attention.

Fainting. Sleep. Distraction. § 311. When the higher functions of the soul are wholly, or in part, put in abeyance, as in fainting, fatigue, or sleep, or when there is bodily weakness, or any disturbance of the nervous equilibrium, as in fever, delirium, or excitement from liquor or narcotics, or even in protracted sleeplessness, the phantasy asserts a more or less complete dominion. The mind is visited with throngs of pictures, which rush so rapidly by as to confuse it by their very swiftness, and to oppress it by a sense of its own impotence to arrest or direct their course. When this condition is permanent, the mind is said to be the victim of phantasy. Such a state is called also a state of *distraction*—which term describes the mind's incapacity to fix the attention or detain these flying images long enough to allow the exercise of the functions of rational memory, invention, or thought.

These higher and rational functions are often in part suspended, and phantasy has a temporary mastery. At such times it presents pictures of persons or events that have been impressed upon the attention by the energy of strong emotion. A paroxysm of fear will stamp an image so ineffaceably upon the phantasy, that it will ever afterwards be held ready to start forth from any object of perception or memory that even remotely suggests it. The mother

is ever beholding with the eye of the mind the image of her child that is forever lost. The perpetrator of crime is haunted by the faces of those whom he has murdered or grievously wronged, both when he does and when he does *not* connect them with any past scenes or acts observed or performed by himself.

Three suppositions possible of the states in question. § 312. These conditions of the soul are grave problems to the psychologist. They suggest questions which his science must attempt to answer. Three suppositions may be made

in respect to them: (1.) These states may be said to be simply abnormal or irregular, recognizing and obeying no law. (2.) They may be set down as simply inexplicable, suggesting the existence of laws which cannot be discovered. (3.) They may be explained in great part by the usually recognized laws of the soul in its normal and wakeful condition. Of these suppositions, we affirm the last. To affirm the second, were to confess ignorance. To do this, if it is necessary, is to be honest and wise; but not unless we are compelled by necessity. Present ignorance should arouse us to the effort of explanation. To affirm the first, were to deny one of our primal beliefs, and to oppose one of our original and strongest tendencies. The probability is, then, immensely in favor of the last. If the laws which govern the recurrence and representation of ideas have been fully and correctly set forth, they ought to explain the phenomena of the sleeping and disordered conditions of the soul. That they do so, is probable for the following reasons:

The power of association is operative in them all.

I. The power of association operates very efficiently in these conditions. In dreaming, somnambulism, insanity, etc., etc., its presence and powers are often most apparent. Whatever else is strange and inexplicable in these phenomena, nothing is more clear or better established, than that the threads of association can often be distinctly traced in them. When we ask ourselves, Why did it happen that I had such or such a dream? or, How did it happen that this thought or that occurred to me perhaps under a strange disguise? it is often very easy to answer by a reference to the usually recognized laws of association. The strange and unexpected sallies of the insane, however wild and preposterous they may be, follow some law of association, though it often leads to the most fantastic result. There is always some method in their madness. Given the impression of some conception or fancy, and it will draw a score or hundred others with it by a rational and orderly suggestion.

Deviations accounted for. (1.) By changes in the relative proportion of the powers.

II. The deviations from the ordinary working of these laws can also, to some extent, be satisfactorily accounted for.

(1.) The powers of the soul ordinarily act in a certain conjunction with and proportion to one another. It is not surprising, that, when a single power acts alone, the phenomena should differ very greatly from those which result from the combined activity of the rest. In the cases supposed, self-consciousness, rational activity, and the voluntary control of the bodily movements and the mental states, are all

set aside and the associative power asserts, to a very large extent, the possession of the soul. We ought not to be surprised, that a power ordinarily acting in connection with the wakeful reason and under its control, should manifest results unlike those which appear when these regulating elements are present. That the images suggested should differ from those suggested by the same exciting causes under other circumstances—that images should even be taken for real existences—that, being believed to be realities, they should suggest images differing from those which they would excite when known to be images only, that the activity of the mind, in this isolated and unruléd form, should seem to be more rapid than in its waking and rational states, are phenomena which should occasion no great surprise. We have, by the supposition, an unquestioned fact—the associative power acting, to a great degree, independently of the other powers. It ought to be expected that its results, and the modes of its operation, should vary from those which attend it when working conjointly with the rest.

(2.) Certain bodily states are known greatly to modify the actings of the soul, when the soul is wakeful and in health.

It is according to the law of its being, that its action should be modified still more when the bodily affections become more efficient and obtrusive. Whether the vital and psychical principles are or are not the same, no fact is more obvious than that the action of the soul is controlled very largely by bodily and material conditions. The power of these conditions upon the soul in wakefulness and health is most efficient, and often irresistible. At times they nearly displace and set aside the higher powers. Weariness, pain, disturbing sounds and sights, and many other influences, so weaken and distract the attention—they so absorb or lower the intellectual and voluntary energy, that perception, memory, reasoning, and even consciousness itself, are well-nigh suspended.

It should not be surprising then, that under other physical conditions, such as sleep and cerebral excitement, even stranger psychical phenomena should be manifest. Whether or not any connection can be traced between these physical changes and the psychical results, the fact that there are extraordinary effects of this sort, is in entire accordance with the analogies suggested by facts that are familiar and acknowledged.

(3.) The comprehensive law under which which past mental states are reproduced, should be distinguished from the materials upon which it operates. While the laws of representation remain the same, the conditions under which, and the materials with which they act, may vary enough to account for every variety of phenomena.

§ 313. The law of reproduction acts out of consciousness. We find it in being and in constant activity. We can neither hinder nor arrest its course. It is continually presenting to our view images or ideal objects of knowledge, of some of

More particular consideration of the conditions of representation.

which we distinctly recall that they have been previously present as realities or images, or infer that this must have been true of them. It is constantly casting up or turning out before us some image that more or less efficiently catches and holds the attention. The suggesting object is often entirely unnoticed. We are not aware how we came to think of some image or picture, that obtrusively thrusts itself upon our notice, or, as we say, springs up in our mind. Here and there we notice one that is more important and interesting than the others. To the actual reproduction of an image, two conditions are necessary, viz., its actual previous presence to the mind, and the existence of an exciting occasion in something united with it as an element of the mind's previous knowledge or feeling.

Unnoticed bodily states may be reproduced in dreaming, etc.

In dreaming, insanity, etc., these conditions vary in both particulars. This is explained in part by the very great variety of elements that enter into the soul's experience.

First, in the states of distinct and easily-remembered consciousness, there are many elements less distinctly noticed—elements purely accessory and subordinate. In the states under consideration, these may be brought forward either as the materials of phantasy, or as the mediate suggestors of other materials. In every act of distinct perception, there is an extended background of such objects, standing out in the field of view with more or less prominence, but all engrossing some share of the soul's energy. Any one of these objects, under possible exciting occasions, is capable of being recalled. In the normal states of the soul, the prominent or central object is usually recalled. In an abnormal state, some one of the accessories may be represented. Under the feelings and purposes of wakefulness, a certain class of pictures and thoughts only may be certain to be thought of. In dreaming, another set may present themselves; in insanity, still another; and yet all of these may have been gathered from the mind's own experience. Again: there are many conditions of the soul marked by little energy of attention, as well as by the feeble influence of rational purpose, in which the phantasy alone prevails.

In walking, in driving for relaxation, in extreme fatigue, in the transitions from wakefulness to sleep and from sleep to wakefulness, in the many listless hours or seasons of reverie, there are multitudes of acts and objects which leave little impression, and are rarely, if ever, distinctly brought back to the rational and wakeful memory or imagination, simply because these are preoccupied by occasions which suggest another description of material from past experience. But there is a possibility that any of these should be recalled under novel circumstances.

The pre-conscious experiences and states.

Again, there are activities that have been experienced previously to the soul's conscious action. The soul exists and acts in a rudimentary way, long before there is a rational apprehension of its states. Some of these acts tend to be reproduced, and, under varying circumstances, may return either as a principal or accessory element. Again: the undefined *bodily sense-perceptions*, or sensations which are accessory in every mental experience, and are prominent in not a few—which form

the background of many, and come into the foreground of many also, all tend to recur again in the rational and wakeful periods of activity they may not, in fact, reappear, because they are crowded out by others that are more important; but, under other circumstances, they may be thrust forward as images, or as the occasions or suggestors of others, and thus, in part, account for the objects thought of by the dreamer and the insane.

But, *second*, we notice that in these abnormal states of the soul, the occasions which control the presentation and suggestion of images are peculiar. In sleep, all the organs of sense-perception are more or less quiescent, while the vital organs are active. In insanity, etc., the bodily condition and activities are peculiar. In both, they are greatly unlike those which are present in wakefulness and health. This is conceded by all physiologists. These peculiar and morbid bodily states are manifest to the soul in the form of peculiar sensations, both vital and organic. Sleep, from the beginning to the end, is attended by a series of sense-perceptions unlike those experienced in wakefulness. We refer to those which pertain to the body, and its subjective condition. Insanity, in all its forms and degrees, is attended by a nervous excitement or depression, which is revealed to consciousness by irritating and uncomfortable sensations. The character of these sensations varies with the nature of their exciting occasions. But these sensations, thus excited, become themselves, in turn, the excitants of images and thoughts kindred to themselves.

For example: suppose, in sleep, when the sensations appropriate to the bodily organs are all withdrawn, some condition of the stomach or the brain furnishes positive and peculiar sensations to the mind. These, by the necessity of the case, are all-engrossing. They fill the mind's field of perception, there being none of the outward senses in action. But if, for any reason, these sensations have been associated with any other objects of knowledge, either realities or images, these will be certain to be revived. These being recalled, in their turn will call up others, and the mind being wholly free from the preoccupations of the sense-world, will be given up to the objects of phantasy, the current of which will be swayed and directed by two elements—viz., the subjective sensations occasioned by the bodily condition and the associating force of the images which the unfettered phantasy suggests. In insanity, let some morbid condition of the brain or nervous organism preoccupy the mind with sensations so painful and absorbing as to forbid the continued notice of the sense-world, or so rapid as to render it impossible for the mind to obtain distinct perceptions even of the more familiar objects, and these all engrossing sensations may not only be confounded with and mistaken for real things, but may act as the suggestors of any images with which such abnormal sensations may have been associated, or to which they are akin.

A third consideration should also be noticed. The *creative power* of the phantasy may have especial activity in dreaming and insanity. Whatever that power may be in its functions and products—if it be allowed that the phantasy is in any sense creative—if, in the waking and rational states, it is not tied to a simple reproduction of the past; if it has any liberty of origination, then it might be natural and credible for it to exercise this freedom more,

The bodily condition excites peculiar images.

The creative power of the phantasy not to be denied.

fully when unlimited by sense, reason, or will, than when constrained by these in the earnest activities of the wakeful and rational hours. That the creations of the phantasy of the dreamer and the madman have no correspondent realities, is obvious to all. The creations of "a madman's dream" are conceived by us as the most unnatural and the wildest of all unrealities. Whether there can be any explanation of the laws of this creative power or not, or any solution of the kind of products which it evolves, it is but just to observe that it is exerted in the sleeping as well as in the waking states. If the phantasy is, in its very nature, a creative as well as representative power, it is not surprising that it should create in madness and in sleep. If its creations are free in the one state, when reason is wakeful and the will is attent, and earnest purposes control, it is not surprising that, in those conditions of activity in which these influences are feeble, its products should be irrational and unnatural.

These considerations may serve as the foundations of a general theory of those various conditions of the soul's activity known as faintness, dreaming, somnambulism, and delirium. They are designed only to prepare for a more particular consideration of each. We consider, first of all, *sleep*, in two aspects.

(1.) *Sleep as a condition of the body, or, Sleep physiologically considered.*

§ 314. We cannot understand sleep as a state of the soul, without considering the corporeal conditions of these peculiar psychological phenomena. In order to interpret it psychologically, we must first consider it physiologically.

In sleep, physiologically viewed, the organs of perception, and the nerves connected with them, are comparatively inactive, and seem incapable of performing their accustomed functions. The nervous activity which is essential to their being used in the service of the soul is greatly weakened, and is often, to appearance, entirely suspended. The power of the eye and the ear to perform their parts as the conditions of the several sense-perceptions appropriate to each, no longer exists. Popularly speaking, these organs of the body are no longer affected by their appropriate stimuli, and no longer themselves affect the soul.

Conversely, also, the soul can no longer control the organs of sense and of locomotion; or, more exactly, the soul loses, in a very great degree, its power to direct these organs. The effluent nerves connected with these

organs are so far weakened or lowered in tone as to render this control very imperfect, and seemingly to destroy it altogether. All the functions which connect the soul with the external world, and which depend on the senso-motor nerves and the cerebro-spinal system, are nearly, or quite, suspended in sleep.

On the other hand, the functions of the vegetative, circulatory, and respiratory organs, which are directly connected with the ganglionic system of nerves, go on as usual, though in the case of some with a somewhat diminished energy. The heart beats, and the lungs are expanded and contracted; the stomach digests, but at a lower than its customary rate. It would follow that nutrition, or the secretion of the food, would also be less rapid and energetically effected. That in all these functions the whole tone of life is lowered, is manifest directly from observation, and is inferred from the greater sensitiveness of the body in sleep, to all those agencies which weaken or endanger the life. The temperature of the body is lowered; hence the need of warmer clothing, and the greater readiness to take cold, to be injured by malaria, or other destructive influences. All these facts indicate that the vital force, or the power to resist antagonistic

The senses, in sleep, are more or less inert.

They are not controlled by the soul.

The vegetative, circulatory, and respiratory life.

agencies, is diminished. On the other hand, it is certain that the nutrition of the brain and the whole nervous organism, is greatly augmented in sleep, and that sleep is even essential to restore the waste of their material which wakefulness occasions. What is the precise manner, or what are the laws by which this restoration is effected in sleep, physiology cannot fully explain. It can only observe and record the fact, of the truth of which there cannot possibly be any question or doubt. That the restoration of this power is especially needed by that portion of the nervous organism which is affected by the action of the intellect, is also beyond dispute.

A few recent and carefully-conducted observations and experiments have established the following results: In sleep, the flow of arterial blood is diminished, and its quantity is sensibly withdrawn from the brain. The apparent congestion of the vessels of the brain is occasioned either by the more sluggish movement and larger accumulation of venous blood, or by the presence of the watery cerebro-spinal fluid. In dreams, the arterial circulation in the brain is somewhat quickened. In deeper and dreamless sleep it is less rapid.

In wakefulness, the brain and body are wasted by the more rapid action of the oxygenated or arterial blood; and hence the wasting, destructive, and exhaustive processes are in excess of the nutritive. In sleep, the nutritive and constructive are in excess of the wasting; so that, while the body is in this condition, not only is the waste of the waking hours repaired, but additional force is accumulated and stored up against the demands which will be made upon it when wakefulness returns. The increased intellectual and emotional activity of the waking state involves the most rapid waste of the brain. If wakefulness is protracted too long, by nervous restlessness, or excessive mental occupation or anxiety, it terminates in fever, delirium, or dementia, through a temporary disease or permanent lesion of the nervous organism itself. Hence, sleep is, if possible, more absolutely indispensable to the restoration of mental activity, than to that of any other human function.

The incapacity of the organs of sense to be affected by impressions from without, as well as to yield to influences or directions from within, varies at different times. It occurs in different degrees, from the slight hebetude or obtuseness of which we are aware on the first approach of slumber, and from which we can easily be aroused by any usual excitement from the world without, up to the deepest slumber from which no external appliances can arouse the subject to even momentary sensibility. The want of control of the soul over its organs, also varies from the momentary loss of power which can suddenly be resumed, to that permanent impotence to speak or move, which is experienced in the most distressing nightmare.

§ 315. In falling to sleep, the soul passes through many of these conditions, beginning with the slightest unconsciousness, and proceeding more or less gradually through more or fewer intervening stages, according as the sleep attains a more or less complete insensibility, and reaches this state by transitions that are more or less rapid. In awaking from sleep, it emerges from a condition of more or less complete insensibility to one in which the senses are fully refreshed and active; and more or less gradually, according as the occasion and manner of its waking is more or less gentle or violent. The same is true of the processes by which it loses and regains its command over the organs.

Cabanis (*Rapports du physique et du moral, etc.*, Mem. x.) endeavors to show that there is a natural and regular order in which the several senses fall to sleep. The sight is the first which becomes quiescent; the sense of taste is next in order; the sense of smell is affected next; the hearing next; and, last of all, the touch. In awaking, the touch is most easily aroused, at least in certain parts of the body, as the feet; the hearing comes next in order, the sight next, while the senses of taste and smelling awake the last. But to this relative proportion of the intensity of sleep there are many exceptions in the case of different individuals, and in the varying bodily and mental circumstances of each, if we say nothing of the general proclivities dependent upon sex, age, etc. While these conclusions may be accepted

as general *formula*, it must still be remembered that no two cases of falling asleep or awakening from sleep even in the same individual, are precisely alike in respect to the stages of progress or emergence.

The different senses, as has already been intimated, fall asleep at different times in various degrees, and awake also in unlike proportions. This is true of the action of the sense-organs on the soul, and of the reaction of the soul upon the organs. Thus, the sense of sight may be very obtuse when the sense of hearing is active, as is the case when a person watches by the bed of one who is ill, or in the instance of men who can find refreshment in sleep when reading or conversation is going on, and be able to recite when awake what has been read or spoken while they were sleeping. The miller sleeps while his mill is grinding, but wakes if it stops. Another person sleeps while it is still, but wakes when it moves. The watchman, when wearied, sleeps with all his senses, except the senses of touch and muscular direction. Soldiers sleep in every sense and organ of motion, except the legs with which they march continually. We may say of almost every case of slumber, that it is unlike every other in respect to the proportion in which each of the senses is insensible or incapable of control.

A remarkable story is told by Felix Platerus of Oporinus, a distinguished professor and printer at Basle; to the effect that he read aloud to another person a long time from a newly-found manuscript, while he was soundly asleep in all his other senses as a consequence of a long and fatiguing journey. (*Hamilton, Met. Lec. xvii.*)

(2.) *Sleep as a condition of the soul, or, Sleep considered psychologically.*

§ 316. The activity of the soul continues during sleep. It is not entirely suspended at any time, though its energy may now and then be exceedingly feeble. That it often acts during sleep, is confessed by all. Every dream involves some form of the activity of the soul. Inasmuch as all men acknowledge that dreams are possible during sleep, all must assent to the proposition that it is possible for the soul to be active while the body slumbers. There is some diversity of opinion in respect to the question, whether this activity is constant, or whether it is ever interrupted. Many have argued that this activity often ceases, from the circumstance that we are not conscious, nor do we remember that we dream all the while that we are asleep; that we know that we dream more frequently when sleep is less complete, as soon after we fall asleep, or just before we wake; that in our deepest slumber it often happens that no signs of conscious activity are indicated to a looker-on; and that it is not necessary to the continued existence of the soul that it be constantly active.

On the other hand, it is urged that the soul is always active, because, on awaking, it is at once aware of its own identity, which involves the belief of continued existence during the interval of sleep; and when it wakes, it may recall or review a continued series of sensational experiences, if it cannot bring back an uninterrupted course of conscious activities. Moreover, it is urged that the fact that the soul does not recall all its dreams does not disprove that it dreams, for there are many waking states during the progress of a single hour, much more during a day, which cannot be recalled. There are also many dreams which we do not recall; as is obvious from the circumstance, that if, on waking, we lay hold at once of the thread which is in our hands, we can trace our way backwards through the maze of even a succession of dreams. When a person is suddenly awaked from the soundest sleep, and even from a state of confirmed stupor, and his thoughts are directed immediately to his mental condition the instant before, he will often be able to recall some absorbing dream; or, if not a dream of definite thoughts and feelings, he will remember a series of benumbed sensations, painful or pleasant, that have occupied his energies. The reason why more of these past activities and experiences are not recalled, is that the waking thoughts and feelings are so all-absorbing as to exclude the opportunity of recalling, if the clue were at hand, and that this clue can only be reached by

One sense may sleep, and others may be awake.

Does the soul cease to act in sleep?

Reasons why many believe it never ceases to act.

many indirect or intermediate trains of activity. That we are often conscious when we sleep, without knowing that we dream, is obvious from the fact that an uncommon light, or smell, or touch, or sound, even if these are very feeble, will awake us, and that we wake ourselves often at a prescribed hour (cf. Hamilton, *Met. Lec.* xvii.).

The constant activity of the soul was argued by the Platonists from its independent and ethereal essence; by Descartes and his school, from their axiom, that the essence of the soul consists in thought, and that therefore, if thought should cease, the essence of the soul would be destroyed. Against the school of Descartes, Locke (*Essay*, B. II. c. i. §§ 10-19) urges that it is not of the essence of spirit to think; and that, for aught we can prove, matter might, by the act of the creator, be endowed with the power of thought. Moreover, he contends that some men never dream at all, and that none are conscious that they dream continuously; making in his argument the power to recall our dreams the test and the measure of the actual occurrence of these dreams. Leibnitz, in his critique upon Locke (*Novæ. Ess.* II. 1, §§ 10-19), replies, that consciousness is not necessary to the soul's activity, and that it would not follow, therefore, because we are not conscious that we think, that we do not think in fact. He also urges, that there are feeble perceptions in all sleep, even when we are not conscious that we dream. This conclusion necessarily follows, from his doctrine of monads, involving as it does the constant activity or dynamic force of all existences and their ultimate elements, in the relations of each to every other; and preëminently, the activity of those which are psychical. Modern psychologists are nearly unanimous in the opinion, that the soul is constantly active, though with unequal energy varying with the different conditions or intensities of the slumber. This conclusion is held by all except those who maintain that psychical activity is properly a function of matter and its organs. It rests upon the grounds which have already been cited, and on the clearer recognition of the very unequal energy of consciousness in the varying conditions of the soul's being.

§ 317. That the soul acts with feebler energy when asleep than when awake, is obvious from the circumstance that in some of its powers it scarcely acts at all with judgment or rational direction. It may be fairly inferred from the general dependence of the tone of its action upon the tone of the body which is observed in wakefulness, which dependence, as may be fairly inferred from analogy, extends to its sleeping states. The only possible exception to this conclusion would be suggested by the fact that some of the powers—a *g.*, the phantasy—may seem to act in sleep with greater energy than in wakefulness. This point will be considered when the action of the representative power is particularly examined. In general, we know from observation, and infer by analogy, in respect both of the sleeping and the waking states, that the psychical energy depends on the vital force, if, indeed, it is not identical with it, so that when the one is lowered, the other is weakened. The only apparent exception to this general remark is found in those conditions when great bodily or vital weakness manifests itself in the irregular and excited action of some of the vital functions, and, in like manner, psychical weakness is exhibited by the excited violence of some of the intellectual or emotional endowments. With this exception, observation confirms what analogy suggests, that, in sleep, the general activity of the soul is greatly lowered.

The powers also act with unequal and varying energy. The powers and capacities of the soul act with unequal and varying energy in different persons and in differing conditions of sleep.

As the sleep of the body varies in the completeness of its effects upon the whole body, and also upon its several organs, so is it with the sleep of the soul. In one dream, the power of sense-perception may be more active than in another. At one time, consciousness, even in the form of reflection, may be active; at another, it may be entirely dormant. The reasoning and inductive faculty in some dreams is intelligently and earnestly alive, while in others there are no indications of the exercise or activity of either.

§ 318. The representative power of the soul, as has already been said, is that which is especially prominent in sleep. The law or force under which it acts has already been explained as the tendency of the soul to act more readily a second time in forms and with objects which have previously occupied its energies. This tendency or force needs only to be supposed to be exerted without the regulating or dividing presence of the other faculties, in order to account for its greater

apparent energy. This energy need be relative only, and not absolute, in order to seem to be greater, when, in fact, the tone of the soul, in all its faculties and activities, may be weaker than in wakefulness. That it is the one power in which this energy is chiefly expended, whether it is greater or less, is so obvious as to be undisputed and unquestioned.

All the so-called laws of association control the production and presence of the objects that make up the image-world of the dreamer. These objects are sometimes recalled under the relations of time and space, in succession or co-existence. Sometimes the relations of likeness or unlikeness control; at others, those of cause and effect. Very often, all these relations must be resorted to, to account for the presence of the various objects of which a single dream is composed.

This force acts, as we know, out of consciousness; and its energy and the grounds of it can only be known by its effects, in the actual emergence of objects to the mind's apprehension. If it operates with but little interference from the directive or rational energies, we should expect that its actings would be unlike those of the regulated imagination or the regulated memory, for the reasons already given. That this is emphatically true of the images in the dream-world, is confessed by all.

§ 319. This comparative irregularity and capriciousness pertains to the order in which these objects are presented to the mind. When the wakeful soul is intent on recalling some object to memory, all the operations of the representative power are controlled by this prevailing purpose. The multitude of varied objects which are presented by the associating power, are entertained or thrust aside by the judging and reasoning intellect, and so an order of their relative value is secured to the objects themselves by the mind's reaction upon them. Even if the mind gives itself up to reverie, it is constantly awake, or ready to be awake, to the suggestions of reason, of use, of beauty, or of rectitude. There are attendant processes of judgment even here, which are constantly discriminating between the true and the false, which judgments must direct the order of the re-presentations.

There is also the rationalizing and sobering presence of the material world, with its obstructive realities that cannot be mistaken; its permanent attributes, that cannot be changed; its eternal and superior laws, that can neither be resisted nor set aside. The perpetual presence of this fixed and orderly body of facts and truths, of itself gives reason and order to the fancies which it must in part control and regulate.

But in dreams there is an absence of judgments, or the judgments are false, and the stream of images flows on, under the joint impulses given it by the energies of the mind's previous activity and the force of casual mental or bodily suggestions. The material world is withdrawn from the mind's cognizance as an apprehended fact; it is as though it were not, and never had existed.

§ 320. The mind's interpretations of the images of fancy, and even of its bodily sensations, are also false and irrational. First of all, it judges the image-world to be a real world. How this is possible, it is not so easy to explain; that it is a fact, cannot be doubted. The only plausible explanation which can be attempted, must be derived from our previous analysis of the process of sense-perception. This analysis showed that the act of original perception is a judgment of diversity—i. e., of the *ego* from the non-*ego*—involving the judgment of a relation to space. The acquired perceptions are even more obviously acts of judgment under which one sense-perception is taken as the sign of another, with a rapidity that is inconceivable and usually with a certainty that cannot be shaken. The first hint or sign carries the mind directly to a positive inference, if the original datum is correctly taken. The conditions of such judgments in both cases may be and probably are some effort of attention involving continuance in time. In dreaming, both these conditions are absent; there is no effort of attention, and the objects judged are not detained for any interval of time. The mind is preoccupied by the action of

Is irregular and capricious. Reason.

The judgments erroneous and wild. Why?

the representing power or phantasy, under which one object or state introduces another; the first one impelling the second, etc., so rapidly that the mind cannot discriminate or judge. Now, the first impulse, when a picture is presented of an absent reality, is to believe it to be real when there is no ground for the opposite belief. This is wisely provided in the constitution of man, to secure all those actions for which the knowledge or the thought of any reality is given. The mind, in dreaming, yields to this impulse. The sense-world is wholly withdrawn, or but feebly indicated, through the temporary torpor of the organs of sense and the coöperating mind. The mind, apprehending no real world with which to contrast and judge the imaginary, uses the little force which remains, to infer that the products of its shifting phantasy are themselves realities. They are believed to be real, for they excite all the emotions which the realities are fitted to produce. Delight is experienced at the image of a friend believed to be present, who is perhaps far distant, or long removed by death. Grief is felt at some distressing event which is simply pictured by the phantasy. The mind is not only incapable of discriminating the real from the fantastic, but it interprets the real to be itself a part of its fantastic world. The bodily sensations which it experiences, the sensations of cold or heat, of oppression in the stomach or the heart, and pain or pleasure in any part of the body, it misinterprets in some fantastic way. Thus Dr. Gregory relates that, having occasion to apply a bottle of hot water to his feet, he dreamed that he was walking on Mount Etna, and found the heat insupportable. A person suffering from a blister applied to his head, imagined that he was scalped by a party of Indians. A person sleeping in damp sheets, dreamed that he was dragged through a stream. By leaving the knees uncovered, as an experiment, the dream was produced that the person was travelling by night in a diligence. Leaving the back part of the head uncovered, the same person dreamed he was present at a religious ceremony performed in the open air. The smell of a smoky chamber has occasioned frightful dreams of being involved in conflagration. The scent of flowers may transport the dreamer to some enchanted garden, or the tones of music may surround him with the excitements of a well-appointed concert. In all these cases, actual sensations are first interpreted as parts of the ideal scene, or they suggest some kindred image, which, in its turn, calls up a succession or series of pictures taken from the actual experience or waking imagination of the dreamer, all of which are believed to be realities. It is more or less distinctly implied by these errors, that the judgment of what is probable or possible is often greatly weakened, or entirely set aside. The incongruous combinations are made of forms that are inconsistent and grotesque, and events that are antagonistic and incompatible. Events and persons very far removed in time and very widely sundered in space, are brought together in a single scene. The person or scene breaks into fragments, and takes on new, incongruous, and motley materials under the very eye of the mind, without any shock to its sense of propriety or probability. The mind receives the new formation without being disturbed by the process of transition, and at once accepts the new to be as truly real as it did the old. The causes have no relation nor proportion to the effects, and the effects are incapable of being explained by their causes; and yet the two are connected as causes and effects (*cf. Milton, Par. Lost, B. v. 100-113*).

The reasoning
and other higher
functions, in
dreams.

§ 321. The exercise of this judgment in respect to the higher relations of thought varies very greatly in the energy of its action, and the perfection of its results. There are many cases in dreams in which single steps or parts of a series of steps in reasoning, are taken surely and correctly, while these processes are entirely disconnected with what went before or followed after, as if the rational powers had resumed for a single instant their full energy of function. In other cases, the reasoning may be correct and the data may be false, and yet the falseness of the data may not be perceived. In still other cases, the data may be correctly discerned, and the conclusions correctly derived, so that both premises and reasoning combine to a valid and true conclusion. Even the more difficult feats of the invention and construction of the materials of an argument, have been successfully performed in dreams. The creations of poetry, even to the

selection of rhythmical words, the composition of sermons and addresses, have been often effected. Difficult problems in mathematics have been solved and remembered; new and ingenious theories have been devised. Happy expedients of deliverance from practical difficulties have presented themselves, and brought relief from serious embarrassments. Tortini is said to have composed the famous Devil's Sonata from the materials recalled from a dream, in which the devil appeared to him, and challenged him to a trial of skill. Mr. S. T. Coleridge gives a detailed account of the composition of *Kubla Khan*, in a dream suggested by reading an account of the hero in *Purchas' Pilgrimage*, a portion of which he wrote down at once, and the whole of which was distinctly present to his memory when he first awoke. Dr. Franklin informed Cabanis, that in dreams he saw often into the bearings of political events which baffled him when awake. Condorcet would leave complicated calculations which he could not resolve when awake, to be taken up and finished while he was dreaming. In Moritz, *Magazin zur Erfahrungs-Seelen-Kunde*, vol. v. p. 59, is a poem composed in a dream by Baron Seckendorf, 1784.

In all examples of this kind, the successful exercise of reasoning and invention is always in that form of activity to which the person is familiarly accustomed, and it is not always easy to distinguish between the suggestion to the memory of what had been previously achieved by a man when awake, and an original act of the mind upon the data brought before him for the first time in his dreams. Trains of thought often repeated by habit, have often the semblance of being the products of original thinking when we are awake. It is not surprising that the same should happen to us in our dreams. It must always be true that the results of practised skill come to the aid of the dreamer, to facilitate his processes.

§ 322. *Consciousness* is ordinarily but feebly exercised by the soul in its dreams. It is often said to be absent altogether. By consciousness is understood the distinct apprehension of the psychical states, as the states of the individual *ego*, and not that fleeting knowledge of them which is essential to any intellectual activity. It is when consciousness acts as judgment, and recognizes the relations of psychical states, that its results remain in the memory. This form or degree of consciousness is usually entirely absent, or feebly exercised in dreams. The reason why it is thus feebly put forth, may be the same which accounts for the absence of judgment in its interpretations of the semblances of the material world. Distinct consciousness requires a certain continuance of the psychical activity of which we are conscious. Each psychical state, in order to be apprehended as existing or as past, must continue for a longer period than is allowed by the hasty and tumultuous appearance of the objects of the uncontrolled phantasy. Even if these objects are apprehended as existing, they cannot, for a similar reason, be apprehended as belonging to the individual experiencing them. The thought rarely occurs to the dreamer, This thought or feeling is my thought or my feeling. These states rush by too rapidly to allow him to think of himself, either as an individual, or as an individual who has previously existed, or as possessed of capacities or a character that have been developed or matured by previous training. None of these processes of reflection or comparison seem compatible with the objective character and the hurried progress of ordinary dreams. In such states, the mind is eminently objective—it is occupied by, and, as it were, absorbed in the images which the phantasy paints and unrolls for its inspection. Hence it follows that so few dreams are remembered, and that here and there only a fragment of a dream comes again to the mind.

§ 323. For the same reason the estimates of time are so extravagantly and even ludicrously erroneous. In our dreams, we occupy a year in making a voyage; we perform a journey, we witness a long procession, we climb a mountain, and yet the time actually expended is inconceivably short. The following has been often quoted as pertinent :

The recital is from Count Lavalette, of a dream which he had when imprisoned under sentence of death. "One night, while I was asleep, the clock of the Palais de Justice struck twelve, and awoke me

I heard the gate open to relieve the sentry ; but I fell asleep again immediately. In this sleep I dreamed that I was standing in the Rue St. Honoré, at the corner of the Rue de l'Echelle. A melancholy darkness spread around me ; all was still ; nevertheless, a low and uncertain sound soon arose. All of a sudden I perceived at the bottom of the street, and advancing towards me, a troop of cavalry, the men and horses, however, all flayed. This horrible troop continued passing in a rapid gallop, and casting frightful looks on me. Their march, I thought, continued for five hours ; and they were followed by an immense number of artillery-wagons, full of bleeding corpses whose limbs still quivered ; a disgusting smell of blood and bitumen choked me. At length, the iron gate of the prison shutting with great force, awoke me again. I made my repeater strike ; it was no more than midnight, so that the horrible phantasmagoria had lasted no more than two or three minutes—that is to say, the time necessary for relieving the sentry and shutting the gate. . . . The cold was severe and the watchword short. The next day, the turnkey confirmed my calculations."

These erroneous judgments of time are the natural and necessary consequences of mistaking the phantasms of our dreams for real substances and events. We picture to ourselves the incidents of a voyage or a journey. We turn these pictures into realities, and they carry with themselves the estimates of time which would be required if they existed or occurred in fact. The weakening of the consciousness of the accompanying mental states, withdraws any corrective influences which would be furnished by the more distinct apprehension of the time required for these psychical states.

§ 324. This weakening of consciousness will serve in part, to answer questions concerning our moral responsibility for the feelings or actions which we allow in dreams. In general, we may say that, in dreams we have no right judgments of the sense-world, or the psychical world, or our own individual states. These data being wrongly assumed, we are consequently not in a condition to judge rightly of what we ought to do or to be. We cannot properly be held responsible for any so-called actions or intentions. We sometimes fancy that we are other persons than ourselves. In such a case, we could not be held responsible for doing what might be appropriate to others, yet is not to ourselves. Whether there is any proper exercise of the will in dreams, we have not yet considered.

§ 325. The activity of the sensibilities in the dreaming state requires a moment's consideration. That we feel in our dreams, or seem to feel, will not be disputed. If we believe we are in danger, we experience terror ; if we dream that we are safe or successful, we rejoice. In some cases, but not usually, the fear and happiness are as intense and as real as when we are awake. In other cases, we feel, but on the review are surprised that we felt no more. Our joy and sorrow are but the pale counterfeits of waking emotions. The intensity of the emotions depends on the strength of our belief and the time of its continuance. If a horrid phantasm or blessed ghost holds the attention and occupies the power for continuance, so that the answering emotion is aroused and intensified, it will be as intense and energetic as in the wakeful state. But if the impression be momentary, it is so quickly displaced, that the emotion is weak, and the recollection of it is feeble.

§ 326. Is the will properly active at all during our dreams ? That we act, as well as know and feel, is obvious from experience. We seem to resist, to struggle, to speak, to sing, to walk, to run, etc. We strive to attend, to remember, to contrive, to compose, etc. ; in other words, we seem to use our mental powers under some directive force for definite objects. Let it be granted that in proper dreams, as distinguished from somnambulism, we cannot move the body ; it does not follow that we make no effort, or that, so far as the soul is concerned, we do not act in the ways specified. It follows that the conative, or impulsive part of our nature—the capacities which fit for action—are employed in the dreaming state. If these capacities are properly called the will, then we use the will in dreaming.

If we mean by the will, the capacity to direct the impulses by a rational or a moral purpose, it is equally clear that the will is entirely dormant, or, at best, is only occasionally as

feebly active. It is and must be inactive, because the appropriate conditions for its exercise are absent. The reason does not propose a distinct end which the mind retains in view. The reflective consciousness neither forms rules nor imposes them. The will cannot act as a rational or moral direction when these essential conditions are withdrawn.

Dugald Stewart (*Elements*, c. v., p. 1, § 5) supposes that most of the phenomena of dream-existence and dream-activity can be accounted for by the supposition that the associative power operates according to its laws without the direction or control of the will. His opinion, stated in his own language, is, "that the circumstances which discriminate dreaming from our waking thoughts, are such as must necessarily arise from the suspension of the influence of the will." This position he illustrates by referring to the most striking and obvious of dream-phenomena. That a force is absent which concentrates and fixes the powers—here called a suspension of the will—is most manifest. But is this a cause, or a result? If the suspension of the will, as thus defined, is a nearly universal attendant of the dreaming state, can we or can we not account for the suspension itself? Why is it that it happens invariably and necessarily, as it would seem, that the action of the will is thus suspended? Might it be resumed, or ought it to be resumed, at any time, or is this suspension of the activity of the will itself the necessary result of those peculiar conditions of the soul which are connected with sleep? In other words, is not the predominance of the vital and sensational activities over the higher, necessarily involved in the very conception of sleep, and is it not a necessary consequence of what we call the connection of the body with the mind? That this is the case, is established by the inductions of general physiology, and confirmed by the observations of psychology. The more or less complete suspension of the functions of the will must be regarded as an incident, and not a cause, of the psychical phenomena of the dreaming state.

Somnambulism, or abnormal sleep.

§ 327. Sleep, normally experienced, involves, as we have seen, so far as the body is concerned, the entire inactivity of the organs of sense, and the entire absence of control over the organs of sense and locomotion. So far as the mind is concerned, the powers of sense-perception are inactive, as well as those of continuous and rational thought, and the representative power principally engrosses the energies of the soul. To this general definition there are not infrequent exceptions. Some of the sense-perceptions are at times more or less active, and the soul succeeds, at times, in affecting some motions of the body. Of these exceptions there are many varieties in respect to the degree of the affection or action, and the proportion in which one power is affected, or acts, when compared with another power.

Somnambulism assumes three forms, which have certain features or phenomena in common, but which, in certain respects, are unlike. These forms are the *natural*, the *morbid*, and the *artificial*. The natural, is that which occurs in ordinary sleep. The morbid, is an incident or phase of active disease of body or mind. The artificial, is induced by the instrumentality of another person. Each of these forms or manifestations is subdivided into varieties, which pass into one another by scarcely distinguishable shades of difference.

§ 328. *Natural somnambulism* is distinguished from normal sleep by the special sensibility of a part—generally some one of the organs of sense—and by special activity in the use of some of the organs of bodily motion.

The appellation, *sleep-walking*, is derived from the act of walking in sleep, which occurs more frequently than any other, for obvious reasons. It is essential to many more. A person reclining, must walk to reach the place where he desires to be. This often attracts the attention of friends, and occasions alarm. It is taken as representing many actions, as writing, talking, singing, spinning, playing on a musical instrument, and hence is applied as a general term to denote them all, and others like them, as well as that condition of body and of mind in which these actions are conspicuous.

A multitude of examples of natural somnambulism are recorded, each of which is distinguished by

some special features of interest. One only will serve for many. "A young nobleman mentioned by Horstius, living in the citadel of Breslau, was observed by his brother, who occupied the same room, to rise in his sleep, wrap himself in his cloak, and escape by a window to the roof of a building. He there tore in pieces a magpie's nest, wrapped the young birds in his cloak, returned to his apartment, and went to bed. In the morning he mentioned the circumstances as having occurred in a dream, and could not be persuaded that there had been any thing more than a dream, till he was shown the magpies in his cloak." — *Dr. Abercrombie.*

The activities required in this case, were the sense-perceptions of sight to direct the movements and the active control of the legs and arms. Sometimes the sense of smell or of hearing, or of taste, are observed to be unusually acute. The use of the voice is often observed. The mental powers are often excited with great energy, continuity, and success. Persons in the somnambulant state will recite passages from authors even in a foreign language, which they could not repeat when awake. Those who are imperfectly proficient in a language converse with far greater ease and correctness than they have ever been known to do in the normal condition. Some remarkable compositions have been written, and eloquent discourses have been spoken, which were quite beyond the ordinary capacities of the individuals from whom they came.

§ 329. In the *magnetic, or morbid somnambulism*, such extraordinary mental power has often been observed as to be ascribed to inspiration from another mind, or to some miraculous deviation from the laws of nature. The subject has been supposed to discover the causes or seat of his own disease in some internal organ, and to be invested with some special sense, or endowed with supernatural insight by which to apprehend his internal condition. He has often shown rare sagacity in discerning characters and interpreting events. He has surprised his intimate friends by the wisdom and aptness of his replies to different questions. He has been thought to foretell future events concerning himself and others; to have visions of such events by a supernatural inspiration or insight.

The ordinary, and the magnetic or exstatic somnambulism, differ from each other, in that the ordinary is preceded and followed by ordinary slumber, while the exstatic comes upon the patient and leaves him at once, usually in a condition of extreme disease. In their psychological features, the two forms of this affection may be considered as alike, differing only in the greater intensity of some of their manifestations. Both are also exaltations of phenomena which are occasionally exhibited in common dreaming and sleep.

§ 330. All these conditions of the soul may be said to be abnormal, and even morbid. For disease shows itself by the disturbance of the equilibrium of the several powers of an organism, as truly as by the weakening of the energy of the whole or of any of the parts. A disturbance of the balanced or harmonious action of these powers may be manifested as strikingly by the excessive and surprising energy of a power, as by its failure to perform its ordinary functions with their usual force. In somnambulism, both these conditions are exhibited; great strength in some powers and achievements, and surprising weakness in others. The manifestations of energy are, however, so surprising as to engross the attention and to withdraw it from noticing the attendant weakness. The observer is often so astonished by the indications of power as to lose sight of the signs of limitation and weakness. He forgets that these feats of knowledge and skill, which seem almost to be inspired or supernatural, are more than counterbalanced by ignorance and blundering.

§ 331. In all forms of somnambulism, the representative power is the most prominently and conspicuously active. The leading objects of cognition and feeling are the mind's own creations. The man lives and moves; he feels and acts in and for a dream. Dream-objects are taken to be real existences, and these engross and absorb the chief energies, and direct to many of the actions. But the

Magnetic somnambulism.

The natural and magnetic distinguished.

Diseases manifested by disturbing the equilibrium of the powers.

Representation active in somnambulism.

dream of the somnambulist is far more methodical and continuous than the dream of ordinary sleep. The mind apparently rests upon its objects for a longer time, and gives to them a more fixed attention than it does to the phantasmagoria of the common dream. Certainly it must do both of these, when it adapts speech and motion to its dream-world, as it does whenever it is prompted to speak, and walk, and lift, and write, at the rate required by its phantasma. We are aware that its sense-perceptions direct the motions and regulate the rate of many of its bodily acts; but it were a serious error to suppose that what it seems to see, or to hear by the ear, makes up the entire world, or the principal part of the world in which the mind has its being and performs its acts. Besides these sense-objects, there is a multitude besides, which make up the background, and the foreground even, of its field of view. In the case of the nobleman cited, in all his movements to and from the nest of magpies, his thoughts were occupied with many phantasms which he considered real, and with reference to which he performed the actions recited. These formed the connecting members and the accompanying scenery of the sense-objects which he perceived. The fact that sense-objects were blended with them, served to steady and retard the progress of the dream, and thus to make it regular and methodical. The feats which the fancy performs, its power of memory, its skill in invention, and its resources of creation, are only the natural results of concentrated attention upon a few, and these connected objects. These feats are, in considerable measure, accounted for by that dependence on certain conditions of the body, and the sensations which they give, which we have already discussed in treating of memory and association. The morbid excitement of some parts of the sensorium and the nervous system, may quicken all the energies of representation, not only by facilitating concentration, but by bringing back the subjective bodily sensations which are the most fertile and ready suggestors of fluent images and words. But this exaltation of the fancy is purchased at the cost of its being limited to but few objects—to single and spontaneous trains of thought running in the courses started and traced by the muscular and vital sensations, or the few sense-objects to which the excited senses are awake.

§ 332. The powers of sense-perception, so far as they are exerted at all, act with surprising energy and effect. It is not only a surprising thing that they should act at all in so profound a sleep; but that the organ should be more sensitive and the mind more acute than in the normal condition, is still more remarkable. But this is often observed in the somnambulist. The objects seen are, often seen by the faintest light, and yet they are seen most clearly, because actions requiring acute vision of these objects are performed with precision and success. The touch must be acute, or the somnambulist could not walk so confidently in difficult and dangerous places, nor avoid obstacles so dexterously, nor perform so many nice operations, as in dexterously writing and playing on instruments. The senses of smell and hearing are often uncommonly sensitive to odors and sounds.

§ 333. The question has sometimes been raised, Whether the somnambulist really perceives with the senses? It has been argued that he does not, because he also dreams, and because his dreams furnish the greater number of the objects of his knowledge and feeling. It has been inferred that, when he seems to perceive, he only dreams, and that what seem to be the objects of his sense-perceptions, serve, through the sense-organs, to form a part of the dreams in which alone he knows and feels. To this it is sufficient to reply that he certainly acts with reference to the real world, and that he really acts—i. e., directs the motions of his legs and arms, and uses and modulates his voice. So far at least as he acts he must have real sensations. What interpretation he puts upon what seem to be his sense-perceptions, is another question. His dream-objects he believes to be realities and sense-realities. It would seem, then, that, instead of turning the sense-perceptions into a dream, he exalts dream-objects into sense-perceptions, and thus causes both to blend into a consistent whole. The weakness of his judgment consists in this, that he does not distinguish between the dream and the reality; but this does not prove that he does not truly perceive the real objects which address his senses.

Some of the sense-perceptions act with surprising energy.

Does the somnambulist perceive at all with the senses?

The sense-perceptions, though acute, are limited.

But while the senses are often surprisingly acute, they are both limited and uncertain in their operation and in their results. The somnambulist sees surprisingly, but he sees only certain objects that are present to his bodily vision.

He does not see every thing in the apartment in which he is present, but only the table, or chair, or the paper on which he writes, or the candle which he holds. Those objects which have some relation to his thoughts and actions are the only objects to which he is sensitively alive. There may be twenty persons before his eyes, but he will not notice them. If he comes very near them, or they stand in his way, he may see enough of the objects to know that he must avoid them—*i. e.*, he may see them in their relations to his own thoughts and actions, but he does not know them as persons, nor recognize them as friends. So, too, he hears those sounds only which have some concern with himself. If a friend addresses him in words that have no relation to his dream, he will not even hear the sounds; but, if these words respect his thoughts and actions, he hears acutely. The same is true of smells and tastes. It is also noticed, that only a single sense at a time seems to be active, according as it is required. As soon as the stimulus or occasion passes by, it is no longer awake, but relapses into entire insensibility.

The various observations that have been made, warrant the induction that the phantasy stimulates and awakens the organ of sense, and determines the mind to use it with wakeful attention. It is the soul itself that quickens the organ thus made ready by disease or weakness for this extraordinary activity, to that momentary excitement which is required to fasten the mind to its monitions. That the soul, as phantasy, can give additional energy to an organ of sense, and, so to speak, prepare it for both sense-perception and action, has been already shown. The apparatus needs only to become abnormally or morbidly sensitive to the perception of sense-objects—*i. e.* to be prepared when held to its work by the fixed phantasy—to account for the extraordinary results of sense-activity which so greatly surprise us in the various modes and degrees of somnambulism.

This extraordinary sentences not without analogies.

This extraordinary exaltation of single senses is not without its *analogia* in the wakeful and normal conditions of the soul. There are occasions when, owing to organic excitement, a single sense becomes painfully acute and sensitive. The concentration of the attention follows as a natural consequence.

If the attention is fixed from a merely awakened interest without any quickening of the organ, whether this is constant or occasional, the results are equally surprising. So surprising is it, that the vision of the sailor, the lacemaker, the horologist, the hearing of the sentinel and the hunter, the touch of the blind, the machinist, and the musician, seem to the stranger to be something almost supernatural. The still higher exaltation of these sense-powers, in the case of the somnambulist, is on the same ascending line with these natural variations. It is only extraordinary in degree, as the circumstances are extraordinary in their nature and combination.

Can the somnambulist have sense-perceptions without the sense-organs?

§ 334. We come next to a subject still more interesting, and, at first sight, more puzzling, *viz.*, the apparent increased excitement of intellectual power as manifested in achievements performed by somnambulists, particularly when in the mesmeric or extatic conditions. The first which we shall consider is the claim for him of the ability to perceive material qualities and objects

without the medium of the organs of sense. For example: it is claimed that he can see near objects through the thickest bandage, and with the back of the head; that he can hear by the epigastrium, etc., etc. It is even asserted that he can see objects a thousand miles distant, and through the closest and thickest walls, and into the darkest and deepest caverns, etc., etc.

First, of near objects.

In respect to the first claim, that near objects can be seen or heard independently of the ear and the eye, we need only observe that, provided many of the stories are neither false nor exaggerated, not one of them proves that the mind can have sense-perceptions independently of the nervous organism.

If the story be received as true, that the person has seen (not remembered nor conjectured;

through an interposed bandage or by the back of the head, it would still be true that the optic nerve and the retina might be so morbidly sensitive as to be affected by the light, even if the eyelids were closed or thickly covered. No fact is more clearly established than that, within certain limits, one part of the sensorium, or portion of a single system of nerves, can, under extraordinary excitement, perform the functions of another. If the theory be accepted, now so current, that the various sensible qualities are manifested as modes and rates of motion, it would follow that the response of the sensorium is by answering rates of motion. If the retina and optic nerves were so sensitive as to respond to these motions or the moving force which we call light, it might make no difference whether this agent were responded to through the eye directly or indirectly, provided that the retina and optic apparatus were efficiently reached and suitably affected. Some *analogia* to these supposed phenomena are found in the so-called subjective sensations, which are occasioned by the direct excitement of the nerves by other media than light, food, odorous substances, etc. It is also to be remembered, that the sense-perception is not complete in any case till the intellect has interpreted the reports of sense. How far the mind, in the extraordinary exaltation of the somnambulist state, can proceed in such a case by feeble reports than those ordinarily furnished, it is not easy to decide.

Second, of objects remote. The second claim is of a power to see distant objects which no sense-power can reach, or objects immured in total darkness behind thick and solid walls. Such a power, or its exercise, can be explained by no known powers or laws of Nature. There is nothing analogous to its possession or its exercise in any thing which we know in the normal actings of the soul. Whatever the power may be which acts in this way, it is not vision. The person does not see the object, but if he discerns any thing, it is a phantasm, an image, or series of images which are purely mental. If there be any thing which he apprehends, it is a mental object, the production of his own soul. It exists while he beholds it, within and for his soul alone. If the object or scene has never been the object of his personal inspection, the pictures which he forms of it must be taken from materials within his own observation, or imparted by description. If it be the city of Pekin, or the Himalaya mountains, the picture is composed either of fragments of what he has seen of New York or Boston, of London or Paris, or the mountains of America, Europe, or else from some drawings or paintings of the cities or mountains themselves. If it should be claimed or proved that the picture or scene is original and yet corresponds to a real object or objects, then the correspondence must be explained by laws and principles which are unknown to the psychology of the soul's normal activities. Whether such a correspondence has ever been established in fact, we will not here discuss.

Third, of the interior of the body. The third claim for the soul, of a power to understand its own bodily disorders, as to their seat or cure, may be explained in part by the fact that the sufferer in the somnambulist state is far more keenly alive than when awake, to his own bodily sensations. If an organ is diseased, the disease will often be manifest by means of sensations which are prominent and unmistakable in the soul's experience. These are the data for its interpretations or inferences. The disease may have been an object of intense anxiety and earnest inquiry. He may have more or less knowledge of the anatomical structure and the natural and diseased functions of many of the organs. If his attention is directed to certain sensations that are made very positive and intense by his abnormal sleep, and his intellect is sharpened to divine their seat or their cure, it would not be surprising if the person should sometimes be successful in his conjectures and prescriptions. In all these cases the thoughts and conversation of the person, if not his studies, will have been occupied with different affections of the several organs, their signs and cures, so that, in a certain sense, he has become a student of medicine, though not scientifically trained. It will always be found to be true, in such cases, that the insight of the somnambulist in respect to the names of the organs and their functions, does not go a step beyond what he has learned by conversation or reading. Let him be ever so gifted, he will not learn the nature or the name of a single organ, or its office, or a single remedy, which has not been made known

to him in wakefulness and health. If this is so, the case is reduced to extraordinary sagacity exercised upon data or knowledge communicated or impressed in an extraordinary manner.

The claim that the somnambulist can see into the condition of the body of another, has already been considered.

Fourth. other extraordinary intellectual activities. § 335. Fourth, the exaltation of the higher intellect to the capacity to perform some very extraordinary achievements, remains to be considered. This is much more remarkable in the morbid than in the natural somnambulism.

The somnambulist sometimes displays great acuteness of judgment. He sees resemblances and differences which had not occurred to him in his waking states, and which astonish lookers-on. He is quick in repartee; solves difficult problems; he composes and speaks with method and effect; he reasons acutely; he interprets character with rare subtlety; he understands passing events with unusual insight; he predicts those which are to come by skilful forecast. In the eyes of the persons who have known him in his waking condition, he appears to be another person, endowed with new gifts, or quickened by some extraordinary inspiration. How are these phenomena to be explained?

We reply: By the excitement of the intellect from an intense interest in the subject-matter with which it is occupied, the concentration of the attention for a long time upon a few objects only and a few of their relations, and the previous familiarity of the mind with these objects and relations. That the mind occasionally acts with energy when in the dream-state, even in its highest functions, has already been noticed. That, when it thinks and reasons in somnambulism, it is animated by strong excitement arising from a strong interest in the subject-matter, is obvious to all, and will not be questioned. So warm is the interest, that, at times, the subject of it seems almost to live in the objects and thoughts which occupy him. All his energy of feeling is elicited by them, and, of consequence, all his force of thought is devoted to them. Such concentration, awakened by excitement, is often the one condition of successful effort. If it can be imparted to an intellect that seemed torpid and feeble, it imparts to it new energy and success. A mind once thoroughly aroused is furnished with triple power.

Next, the attention is concentrated upon objects for a sufficient length of time to secure entire familiarity with them and their relations. The attention of the somnambulist is limited, as we have seen, to but few sense-objects. To all other objects except those which excite this or that sense, it is deaf and blind. The phantasms which make up its dream are but few. Upon these it dwells, and to these it continually returns, till they become altogether familiar in all the few aspects and relations which concern his dream. From all the rest of the world he is shut out, being held for continuance to this limited field of view, and detained before it by the sense-objects to which his dream is related.

Last of all, the sense-objects and the dream-objects are ordinarily very familiar. They have previously been the frequent object of thought and speculation. The questions for which he finds new answers, the problems for which he devises new solutions, the events or characters upon which he casts a new light, are not for the first time before his mind. The operations of his intellect are also all in the line of his previous efforts and training. The somnambulist does not for the first time appear as a mathematician, poet, orator, politician, or divine; nor does he display activities which have not been in their quality and kind, though not in degree, familiar to his use. Even the very subjects upon which he displays extraordinary wisdom or wit, are usually known to have engaged his previous thoughts, and to have received earnest and frequent attention. This previous thinking has prepared him to discern new relations, to form new judgments, or to arrange in new combinations matter that had already been familiar to his thoughts. It is not out of analogy to the processes and laws of the mind in the waking state, that, under strong excitement, with necessarily limited attention and upon familiar objects, it should rise to extraordinary achievements. But extraordinary as they are, their very extraordinary character

reveals the very limitations which are their condition. Its triumphant feat are not only counterbalanced by, but they are dependent upon degrading and limiting concessions.

Moreover, these efforts themselves are single and isolated sallies of subtlety and insight, rather than sustained and connected trains of judgment and reasoning. They are narrow rather than comprehensive, acute rather than far-reaching, exceptional rather than uniform, surprising rather than trustworthy. Whatever may be their rank as evidences of genius, or their value when used by another mind, they avail little or nothing to the person himself for his future use and guidance because they are not connected with his previous thoughts or his permanent acquisitions.

The gift of divination, or prophecy, which is claimed for the somnambulist, whenever it deserves consideration, is explained in part by the extraordinary sagacity which is developed in respect to subjects that are interesting and familiar to the mind. The somnambulist forecasts or prophesies, by reasoning upon the evidences before him. His attention being fixed and his interest being aroused, he applies his intellectual force to the subjects before him, and shows the same sagacity in foreseeing future results that he exhibits in interpreting events that are present; by the causes, the laws, and principles that are concerned in bringing them to pass. Other of his conjectures which are confirmed by the results, may be ascribed to accidental coincidences in cases in which but few alternatives were possible. Psychology can go no further in explaining such events by the known operations and laws of the soul of man. A rational philosophy does not deny the possibility of supernatural aid or guidance in foresight of the future, whenever there is worthy occasion for such interference—i. e., whenever there is an end sufficiently important to warrant its use. But it forbids the belief that it is imparted for trivial or unworthy objects, or on common occasions.

One or two other features common to all the varieties of somnambulism remain to be noticed.

§ 336. First, the somnambulist, when he wakes, usually, though not invariably, forgets his actions, perceptions, and thoughts during sleep. His dream, with all that it involves, is to him an empty blank. To many, this seems incredible; to others, it is an insoluble mystery. That it is not incredible, is established by the amount of decisive evidence which is adduced of its actual occurrence. That it is not inexplicable, appears from analogous phenomena in dream-life, as well as from the dissimilarity of the conditions of mental activity in the waking and the somnambulist state. The dreams of the profoundest sleep are rarely remembered, for the reason that the bodily condition, with all the sensations which it involves, is, in many respects, very unlike that which attends our lighter slumbers and our waking states. The sensations which accompany these varying conditions, as has been shown, are an essential element in our mental experiences. If the phantasy is active, they are the essential conditions of its activity in any determinate direction. For this reason, these bodily sensations direct the course and furnish the occasions for many of our dreams. But in somnambulism these sensations are more controlling and more unique than in any other dreaming or in any other sleep. Whatever else there may be which awakens and directs the phantasy is, if possible, still more unlike any other experiences of wakefulness or sleep. If the transition from ordinary sleep and ordinary dreams to wakefulness is often so abrupt and complete as to involve entire oblivion of all which we have thought, or felt, or done, it is less surprising that, when we awake from the sleep of somnambulism, whether the transition be sudden or gradual, it is so complete that the present has no relation to the past. For the functions of memory it is as though we had entered a new world, or begun a new existence. Our bodily experiences, the objects which we discern, the feelings which we experience, and the acts which we perform, are all so peculiar, that we do not remember our own selves. We do not, for the reason that what constitutes ourselves—i. e., our experience of states of feeling and thought—in the two cases, is greatly unlike. From those obscure bodily sensations which we can distinguish or define, up to the most obtrusive objects of sense and consciousness, with the imagery of phantasy

which they suggest, the springs of activity, the materials for feeling, and the objects of thought, are so diverse, that the man in the one condition, does not remember himself in the other.

§ 337. These considerations both explain and confirm the second fact that has sometimes been observed, viz.: that the somnambulist, when he passes into a succeeding condition of abnormal activity, remembers the experiences, and, as it were, remembers the self of the preceding states. How this should be possible, most clearly appears from the principles already laid down: The objects of thought and memory, the motives and directors of action which were present in the previous condition, return to him a second time, and they bring with them their attendant experiences. When the soul passes a second time into the surroundings of his abnormal being, they are no longer strange, but he recognizes them as familiar, and, taking up new threads of memory, he recalls his preceding dream.

Capacity for alternating states and activities.

Some remarkable instances are recorded of alternating states, in each of which the acquisitions, the capacities, the employments, were unlike those in the other, and yet, as the similar states recurred at intervals, they were connected by continuity of memory.

One instance is described as follows: "The patient was a young lady of cultivated mind, and the affection began with an attack of somnolency, which was protracted several hours beyond the usual time. When she came out of it, she was found to have lost every kind of acquired knowledge. She immediately began to apply herself to the first elements of education, and was making considerable progress, when, after several months, she was seized with a second fit of somnolency. She was now at once restored to all the knowledge which she possessed before the first attack, but without the least recollection of any thing that had taken place during the interval. After another interval, she had a third attack of somnolency, which left her in the same state as after the first. In this manner she suffered these alternate conditions for a period of four years, with the very remarkable circumstance that, during the one state, she retained all her original knowledge; but, during the other, that only which she had acquired since the first attack. During the healthy interval, she was remarkable for the beauty of her penmanship, but, during the paroxysm, wrote a poor, awkward hand. Persons introduced to her during the paroxysm, she recognised only in a subsequent paroxysm, but not in the interval; and persons whom she had seen for the first time during the healthy interval, she did not recognise during the attack" (Abercrombie, *Inquiries*, etc., p. iii. § iv.)

The artificial somnambulism. Induced by the agency of another person.

§ 338. Certain peculiar features of the *artificial somnambulism* remain to be noticed. Its distinguishing feature is, that it is induced by the intervention of another person, who, by means of passes or other appliances, brings the subject into a sleep and dream, the processes and objects of which he directs, and from which he awakes him at his own will. Hence it is called artificial, as effected by another, in distinction from the natural, which is induced by ordinary sleep, and the morbid, which is the incident of active disease. It is also called the magnetic sleep. It originally received this appellation, because it was supposed to be produced by a magnetic influence, generated by or attendant upon all the animal functions. This influence was supposed to be generated or accumulated in some persons in larger quantities than in others, and to be emitted by them at their will in such a way as to affect a correspondent receptive force in others, who are thereby subject to any influence which is emitted from the more highly magnetized person. The influence in question was supposed to be akin to the magnetic force which pervades the earth, and inorganic matter generally. The appellation is retained by those who do not receive the theory on which it was originally employed.

Traces of this doctrine may be found in the writings of Paracelsus. It was received also by the Rosacruzians, favored by Goelenius, Van Helmont, Robert Fludd, and many others.

The most notorious practitioner of the art in modern times was Mesmer, who expounded the doctrine of animal magnetism as already explained, and practised it with abundant apparatus, designed to collect and control the so-called magnetic influence with the aid also of many appliances addressed to the imagination, and which were fitted to invest his person and his processes with greater mystery. M. de Puységur, following Mesmer, abandoned the use of magnets, etc., and relied on passes or motions of the hand to produce the so-called magnetic effects, and this gave the new form to the practice of the art which has ever since been followed.

§ 339 There is still another condition called *hypnotism*, or the hypnotic state, which may be properly called the artificial sleep as distinguished from the artificial somnambulism—i. e., the artificial dream. It is like somnambulism, as produced by the agency of another, and as being under the control of the producing agent. The connection of the mind of the operator with the mind and the actions of the subject, is not so manifest, or is not always carried so far as is claimed for the other. It is however so like it in every essential feature, as to deserve to be considered as at least a lower degree of artificial somnambulism.

The name *hypnotism* was first applied to this state by James Braid, M. D., etc., etc., a distinguished physician, of Manchester, England. As the result of a series of experiments which he instituted to test the doctrines of Reichenbach, as laid down in his *Researches on Magnetism*, in support of a new imponderable which should explain the phenomena of animal magnetism, Dr. Braid discovered that he could induce an artificial sleep upon susceptible patients, by fixing the attention of the eye upon a bright object, without the instrumentality of passes. This sleep, in his view, is the result of a congestion of the organ of vision and of a part of the brain. It is partial only, and leaves a part of the system open to sensible impressions, so that it is possible for the operator to maintain some communication with the subject of it by words and signs. The production of this sleep, and the processes which occur while it is going forward, are considered by Dr. B. as examples of the control of the body by the mind. The direction of the attention to the several organs and other parts of the body, results: first, in a greater excitement of their normal activity; second, in illusions of sense-objects when the attention is stimulated by the imagination of the subject and the voice of the operator; third, in a congestion terminating in an abnormal sleep, which can be directed and controlled by the operator. Dr. B. supposes that, as the result of long practice, this sleep may be voluntarily assumed and continued for several days, forming what he calls "*human hybernation*." See *Hypnotism, or Nervous Sleep considered in relation with Animal Magnetism or Mesmerism; also, the Power of the Mind over the Body*, etc., etc. See also *L'Electro-dynamisme vital*, par J. P. Philppe.

For the purposes which we have in view, hypnotism and artificial somnambulism or mesmerism, may be considered as one. The states so designated have the following features: Artificial sleep; entire or total insensibility of some of the sense-organs; an unnatural excitement and acuteness of others; the capacity to maintain some relation with the operator, so that the sleep and the dreams of the subject are under his exclusive direction and control. All these phenomena, with one apparent exception, are analogous to those of the forms of somnambulism already considered. The production of the sleep is the result of an excitement of some of the sense-organs or parts of the nervous system, initiated by exciting and fixing the attention of a susceptible patient, by the aid of a strong will and the energetic activity of the operator. The physical and immediate cause of the sleep is common to all the cases. It is the congestion of the brain. The occasions or causes of the congestion are diverse. In natural somnambulism, it is an incident of ordinary sleep in a person of sensitive organism. In morbid somnambulism, it is an attendant of active nervous disease. In the artificial, the congestion is the result of the attention of the patient leading to excessive physical excitement of some part of the sensorium.

§ 340. In this form of somnambulism, the feature which is at once the most distinctive and the most difficult to explain is the control of one mind by another. While the patient is inaccessible to communications from every other person, he is open both to communications and impressions from the operator. Not only is he open to communications from him, but he is also in a considerable degree subject to his control. The senses and the attention are both sealed to words and signs from every one besides, but they respond with unnatural sensibility to the slightest intimations from a single person. To many this seems incredible, and they reject all testimony in its support as unworthy of confidence. To others it is an enigma, which cannot be explained by any of the known laws of the soul's activity.

If, however, we consider the phenomena of natural somnambulism, or even those of the common dream we shall find some striking points of resemblance. In both these conditions great insensibility of certain powers is conjoined with extreme sensitiveness of others. The

dreamer and the somnambulist are dead in some of their senses and comparatively alert and active in others. The phantasy of both is active. To ordinary persons any approach to their inner life is entirely precluded. But to the observer who understands the habits, or can interpret the dream of either, it is not difficult to gain the attention, to institute and maintain conversation, to effect a communication with the thoughts, to give positive direction and control to the thoughts, and, through the thoughts, to the feelings. No feature of a person in this condition is so striking as the entire and helpless dependence of some of his powers on other persons for stimulus and guidance, and the passiveness with which both the senses and the fancy respond to their suggestions, and assent to their assertions.

In the artificial somnambulism these extremes are intensified. The natural equilibrium is more effectually disturbed than in the state just described. The insensibility of some of the powers, and the sensitiveness of others, are heightened. This condition is induced by processes that bring the operator prominently before the attention of the subject, and connect him with the trains of thought which his phantasy pursues. The subject falls asleep with his eye fixed upon the operator, by obeying directions which fell from his lips, and following motions and signs which engrossed his own attention. When the sleep is effected, it is in its nature but partial. A portion only of his powers are awake, and, by concession, are morbidly and sensitively alive to their appropriate impressions. It is not unnatural, rather is it most natural and reasonable, to expect that these so sensitive powers would respond to the voice and even to the tones of the one person to whom the patient had passively surrendered in the beginning of the process; that indications which escape the notice of ordinary observers, should be intelligible and patent for him, and that, when these indications are conveyed, they should control all his movements of thought and feeling. It is credible that the pictures before the fancy of the operator should be awakened in his own, and that his positive assertion should not only be taken as proof of their real existence, but should cause the subject to believe that his own senses perceive them, so that he should believe he sees a mountain, a house, brilliant colors, smoke, flame, etc., etc., at the will of the operator who dominates over his fancy.

§ 341. There are not a few who require us to believe more and to explain further than we have already done. They assert that the operator can not only connect himself with the mind of his subject by the ordinary media of communication and direction, but that he can do so by what, to the senses, seems to be no medium at all, but which they assert is an impalpable, magnetic fluid. At all events, they insist on the fact that the operator can direct the thoughts and control the phantasy of the subject simply by willing to do so. They contend that his thoughts are followed by those of his subject by becoming the object of his direct insight; that the pictures of his fancy are revealed to him as realities; so that, whatever scenes he conjures up before the imagination, he can will to become realities to the patient with whom he is in complete rapport. If these are facts, we are free to confess that they cannot be explained by the principles and the laws of the ordinary psychology. On the other hand, this psychology can go far toward explaining why what is credible, as already accounted for, should be mistaken in the way we have described. It is not difficult for us to understand or believe that, to a person so sensitive to impressions as the subject manifestly is, many intimations would be effective which escape the observation of uncritical observers, if we say nothing of the deceptions which are the result of charlatanism and collusion. The balance of probability may be fairly said to be on the side of the version which we have given of the facts, and their possible explanation.

§ 342. Our discussion of the phantasy would not be complete, if we omitted to notice the phenomena of hallucinations, and spectral apparitions or illusions. A distinction should be made between the proper images of the phantasy, when mistaken for or believed to be realities, as by the dreamer and the somnambulist, and the actual vision of images in the formation of which the senses

Still higher
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coöperate, such as occur to persons in a morbid condition when they are broadly awake, as also to those attacked by fever, or to such as suffer from the effects of certain narcotica or intoxicating drugs. One of the most remarkable cases of continued exposure to such visitations, is that recorded of himself by the celebrated Nicolai of Berlin in the *Transactions of the Royal Society of Berlin*, for 1799. We copy the translation in *Nicholson's Journal*, vol. vi. p. 161:

"During the latter six months of the year 1790, I had endured griefs that most deeply affected me. Dr. Selle, who was accustomed to bleed me twice a year, had deemed it advisable to do so but once. On the 24th of February, 1791, after a sharp alteration, I suddenly perceived, at the distance of ten paces, a dead body, and inquired of my wife if she did not see it. My question alarmed her much, and she hastened to send for a doctor. The apparition lasted eight minutes. At four in the afternoon, the same vision reappeared. I was then alone. Much disturbed by it, I went to my wife's apartments. The vision followed me. When the first alarm had subsided, I watched the phantoms, taking them for what they really were—the results of an indisposition. Full of this idea, I carefully examined them, endeavoring to trace by what association of ideas these forms were presented to my imagination. I could not, however, connect them with my occupations, my thoughts, or my works. On the following day, the figure of the corpse disappeared, but was replaced by a great many other figures, representing sometimes friends, but more generally strangers. None of my intimate friends were among these apparitions, which were almost exclusively composed of individuals inhabiting places more or less distant. I attempted to produce at will persons of my acquaintance, by an intense objectivity of their persons; but although I could see two or three of them distinctly in my mind, I could not succeed in making exterior the interior perception, although I had before seen them afresh when not thinking of them. The disposition of my mind prevented me from confounding these false appearances with reality.

These visions were as clear and distinct in solitude as in company—by day as by night—in the street as in the house; they were only less frequent at the houses of others. When I closed my eyes they sometimes disappeared, although there were cases in which they were visible; but so soon as I opened them, they reappeared immediately. * * *

About four weeks afterward, the number of these apparitions increased. I began to hear them speak. Sometimes they conversed together, but more generally addressed their conversation to me, which was brief and agreeable. At different times I considered them as tender friends, who sought to soften my griefs.

Although at this period I was well, both in body and mind, and these spectres had become so familiar as not to cause me the slightest uneasiness, I nevertheless endeavored to dispel them by suitable remedies. It was resolved that an application of leeches should be made, which was accordingly done on the 20th April, at 11, A. M. The surgeon was alone with me. During the operation, my chamber was filled with human figures of all kinds. This hallucination continued uninterruptedly until half after four, at which time digestion commenced. I then observed that the movements of these phantoms became slower. They shortly began to grow paler, and at seven o'clock, had become perfectly white. Their movements were rather more rapid, although their forms were as distinct as before. By degrees they became more misty, and appeared to melt into air, although some were still apparent for a considerable length of time. By eight, the room was entirely cleared of these fantastic visitors. Since then I have several times thought that the visions were about to return, but they have not."

The case of Nicolai is by no means solitary. There are not a few persons of sensitive organization who occasionally see distinct images, visions, and phantasms of real objects, which have distinct form, distinguishable color, and a certain permanent endurance like objects actually seen. These phantasms, moreover, take their place in relation to real objects. They are seated in chairs, they stand by the bedside, they look through the window, and have the dimensions which are suitable to their place and their distance from the observer. If the judgment of the subject of them is clear, and his self-command complete, he knows they are not real objects, even though he cannot remove them. (Cf. *Hallucinations, or the Rational History of Apparitions, Visions, etc., etc.*, by A. Brierre de Boismont, Phil. 1853.)

These phantasms are much more frequent in transient delirium from fever, or permanent insanity. They are the almost invariable result of a variety of drugs, as opium, hasheesh (*Cannabis Indica*), and stramonium. They are the fearful attendants of that irregularity of nervous action which is the consequence of excess in the use of intoxicating liquors. It is noticeable that phantasms of a certain description are peculiar to each of these drugs, as well as to the *delirium tremens*. These phantasms are not confined to vision alone. The other senses have their appropriate phantasms; the ear has sounds, the touch various feelings, and

the nostrils distinguishable odors. None of these, however, are as definite, as permanent, or as clearly distinguishable as the phantasms of vision.

§ 343. It is important to distinguish these phantasms or apparitions from the images of the phantasy proper. Unless we do, we cannot clearly understand or interpret the phenomena of delirium, and certain other forms of mental aberration. Two agencies concur in their production—the action of the phantasy by means of the spiritual image, and that of the sense-organ which is appropriately concerned. It has already been observed, that when even a sense-object is imaged, especially if it be vividly and continuously pictured by the phantasy, as a sound or sight, the mind's attention to it tends to awaken a sympathetic activity of the sense-organ by which the object was originally perceived. By this provision the organs are enabled to act more promptly in case of a second perception, the phantasy working in aid of perception. It is a part of the same provision that the emotions appropriate to both images and objects are called forth, and the emotion or feeling appropriate, both tend to excite and fix the sense-organ to a more energetic sense-perception. By reaction, also, the sense and locomotive organs, when placed in the required attitude, act in their turn upon the phantasy, so that the assumption of an attitude, the adjustment of the features to the expression of an emotion, or the exercise of a perception, carries with itself a strong tendency toward the feeling or act that is appropriate.

Again, in the sense-organism psychologically considered, there is a tendency to be excited or impressed a second time without a sense-object, in a manner similar to that which the presence of the object originally occasioned. Sometimes, in conditions of the system not known to be abnormal, this excitement goes so far as to give to the mind all the conditions of transient sense-perception. As a consequence, the mind has actual percepts without material objects, especially on waking from sleep. The mind sees colored spectra, and hears sounds when there are no material things or objects to be seen or heard. These occasional phenomena clearly establish the truth that the sense-organism, without the stimulus of an object, can be brought into a condition nearly allied to that to which it is excited by that object. Whether the excitement is mental or physical, is of little import, provided that the excitement is furnished. Let, now, the sense-organism be in a condition of morbid sensibility, and let the phantasy be also morbidly aroused, and it is not unnatural that phantasms should take material forms or be invested with material qualities; nor is it surprising that, with the action and reaction of mind and body, these should seem for an instant to be real, until the judgment corrects the half-formed inference. But let the judgment itself be disturbed by more serious disarrangements of the nervous system; let the conditions of attentive comparison, continuity of memory and of thought, all be disturbed, as is the case in many forms of delirium, and the raving madness which sees nothing but phantasms where it ought to see realities, or which invests the real objects of sense with fantastic shapes and attributes, are fully explained (cf. §§ 109, 237).

§ 344. It is no part of our duty to give a scientific theory of insanity. We have only attempted to explain the part which the phantasy has in the mental operations, under this condition of irregular psychical activity. We ought also to add, that it is by no means universally the case that the insane are haunted with phantasms. It often happens that insanity is the result of mere mental confusion or distraction, such as may result from the excessive rapidity or the excessive preponderance of certain organic or vital sense-perceptions. These may so distract or preoccupy the attention, as to preclude the possibility of a cool judgment or a controlled activity in respect to any matter whatever. In such cases, the phantasy, as well as the perceptions, are either so hurried and flighty, or so fixed and recurring, that the activities of memory, comparison, and judgment are all untrustworthy. Or, again, the mind, and not the body, under some overmastering passion, has given to phantasy such complete control over the other powers, as to disturb the equilibrium of spiritual activity. In these cases the phenomena are purely mental. The sense-perceptions are correctly made. The vision is disturbed by no

Insanity.

spetra. There are no special disturbances of the bodily sensations. But the mind is occupied with inferences incorrectly derived from its past experiences or its present condition. It is haunted with depressing images, or gloomy forebodings. Its distracted phantasy is so overpowered as to set at naught the testimony of the senses, the asseverations of trusted friends, the conclusions of its own better judgment, the principles, the faith, and the hopes which had been the soul's support and guide. (Cf. J. E. Purkinje, *Wachen, Schlaf, Traumen*, in Wagner's *H.-W.-B.*; W. B. Carpenter, *Sleep*, in Todd's *Cyc.*; A. Lemoine, *Du Sommeil au point de vue Physiologique et Psychologique*, Paris, 1865; M. L. F. A. Maury, *Le Sommeil et les Rêves*, etc., Paris, 1862; Dr. Lyon Playfair, *On Sleep*, etc., *Northern Journal of Medicine*, 1844; A. Durham, *The State of the Brain during Sleep*, *Guy's Hospital Reports*, 3d series, vol. vi. 1866; A. Brierre de Boismont, *Hallucinations*, etc. (translated from the French), Phil. 1858; W. Griesinger, *Mental Pathology and Therapeutics* (from the German), Lond. 1867; H. Maudsley, *The Physiology and Pathology of the Mind*, New York, 1867).

CHAPTER VI.

REPRESENTATION.—(3.) THE IMAGINATION OR CREATIVE POWER.

From the *phantasy*, the most passive form and exercise of representation, we proceed to the *imagination*, its most active and elevated energy. In *phantasy*, representation sinks into an almost unconscious agency, that owns no allegiance to reason or intelligence. In *imagination*, it is elevated to the intelligent service of feeling and thought, of duty and religion; and gives birth to the noblest products of poetry, science, and art.

§ 345. In treating of the creative imagination, we shall first consider the general characteristics, conditions, and laws, which are common to this power in all its phases and degrees of activity, and then the special forms in which it is manifested. The field of inquiry is very wide, and it includes subjects of varied interest. It includes all those processes in which man rises above the position of a simple copyist from nature and experience, and in any sense originates new products. The appellations in common use to designate these processes, or the capacities for their exercise, as *fancy*, *imagination*, *invention*, *reverie*, are not applied with technical exactness, nor do they answer the ends of a philosophical explanation. They do not satisfactorily define the processes nor the powers, nor divide them by lines that are distinct and clear; nor do they explain their products by their real principles and laws. And yet we are obliged to use and recognize them, for they are too closely intertwined with our common speech, to be laid aside or displaced.

Our *first* duty is, to consider the conditions, laws, and characteristics which are common to the creative imagination. We ask, first of all, what are the materials which are furnished to this power from nature and experience, and which it is forced

to make use of in all its creations? In answer to this general question, we would say:

1. Space and time are always employed in these processes, and always appear in their products. The objects that are conceived, whether by the poet, the dramatist, or the inventor, as forming the scenes in which their personages, materials, or machinery are introduced, or within which they are conceived, are invariably subjected to the laws and relations of space. The acts and events which are described or imagined, all take place under the conditions of time. They precede and follow one another. They are either present, past, or future. The world of the imagination is always a world of imagined space and imagined time, as the world of reality is a world of real space and of real time.

Thought concep-
tions and rela-
tions.

2. The necessary and universal thought-conceptions and relations under which we cognize real beings, are always supposed and employed. Every being and thing which we imagine, we imagine more or less distinctly, as substance with attributes, as cause and effect under proper conditions, and as means and ends. These original intuitions and relations, under which we view and by which we connect the parts of the existing world of matter and spirit, must all be introduced and observed in the world which we create. Every one of them must be used, or the work would not be rational; but not a single new one can be suggested or evoked by the utmost energy of the creative power.

It is not intended that the imagination should picture these in their abstract form. They cannot be imaged, any more than they can be perceived by sense or consciousness. But as concrete objects can be perceived only under these relations when they are imaged, they can and must be imaged as observing them. To these conceptions and laws we subject the whole realm of imagined beings, precisely as we subject to them the real world, whether of matter or spirit. But we cannot, by any creative energy, add a single new thought-conception or suggest a single new thought-relation.

The imagination
limited to mate-
rial qualities.

3. The imagination is limited to the material qualities which nature furnishes. We cannot create or conceive of new colors by any exertion of creative energy. Hume and Tetens both suggest, that if the imagination were furnished with the colors *blue* and *yellow*, it could, by combining the two, image the color *green*, without ever having seen it. The mistake is twofold. The eye does not see the *blue* and *yellow* in the *green*, but the product which results from the combination of the two. The imagination cannot go beyond what the bodily eye furnishes.

In a similar way, the imagination is limited with respect to all the simple qualities of sense, to tastes, and sounds, and odors, and tactual feels. In cases when a new percept or property, as a *taste*, or *sound*, or *color*, seems to be invented by art, the imagination can only anticipate the result of its devising, by a likeness or analogy to some remembered experience; but it cannot image beforehand the product itself.

Limited also to known spiritual powers. 4. In like manner, the imagination is limited to the spiritual phenomena and processes which consciousness reveals, as well as to the kinds of powers which these processes suppose. What it is to know, and feel, and will, we know by the varieties of our own experience; and what a being is who can exert these activities, we are taught by consciousness. In this way we learn what are the acts, and products, and capacities of spirit.

No effort at creation or construction will enable us to originate a single additional power or product beyond these limits, nor a spiritual agent that does not possess these or like endowments. If we imagine the spirit of a brute, and, its actings, and seek to enter into its consciousness, we imagine it as possessing some of these powers at least, with limited energies and products. As we ascend into the thoughts and feelings of higher spirits, we reverse the process.

These are the varied materials which are furnished for the service and use of the creative power—the world of matter and the world of spirit, with their wealth and variety of things, agents, and events, limited by the finite relations and connections of space and time, subjected to the conditions of thought-knowledge, or of rational combination and analysis. These materials are all gathered from the experience of each individual, and may be represented by the laws of association, for the moulding and plastic energy of the creative function.

It creates new products. In relation to space and time.

§ 346. We inquire, *second*, What new products can be evolved and created out of these materials by the imagination proper? We follow the order of the topics already adopted.

(1.) In respect to space and time, though we cannot imagine objects to exist nor events to occur out of relation to each or to both, yet we can, imagine them to bear relations to them, to which there is no type of reality. The variety of actual relations of this kind is vast, yet limited. Above all these, the imagination rises, and beyond all these it soars, forming for itself, at its will and what it will, out of the immeasurably vaster range of possible relations.

We take a few examples of the changes which it makes in the *size* of objects.

In the size of material objects.

The types of animals actually existing, as of the horse, the man, the elephant, and the mouse, lie within certain extremes, the greatest and least of their kind ever known. The imagination scorns these limits, and it can give us

horses of every size, from the ponies of Queen Mab up to steeds large enough for the uses of a giant. It can create men smaller than the Lilliputian, and larger than the contrasted Brobdignag. It can make elephants smaller than mice, and mice larger than elephants.

In their relative position.

Again, the *position* or *situation* of objects is determined by the character of their material and the laws of nature. Mountains hold a certain relation to valleys, streams to meadows, groves to lawns, houses to gardens, cities to harbors, roads, and rivers; so that, where we find the one, we expect to find

the other. But the imagination acknowledges none of these relations or laws of combining or conjoining objects in space. While it must imagine them all spatial, it can place them as

It will in space. It can plant a garden in a desert a thousand leagues from a dwelling of man. It can build and people a city, without harbor, river, or road. In its grouping of copse and lawn, and of meadows and streams, it can conceive of combinations and contrasts more picturesque than were ever effected at Chatsworth or at Kew.

It changes material forms.

There are fixed *forms* of objects in nature, as the drooping elm, the aspiring pine, the umbrageous beech, the massive and gnarled oak. In rock and mountain, certain types are ever recurring. The same is true of the form of the horse, the deer, the dog, and of man himself. But the imagination can draw more graceful lines than nature has ever shaped, the material with which she works being more intractable, and the action of staining and decomposing elements being inevitable. Following her idealizing images, art has given us the Egyptian tomb and pyramid, the Chinese pagoda, the Grecian temple, and the Gothic cathedral, none of which are copied from nature, though all have been suggested by her forms.

In one aspect they surpass nature, for their lines are more consummately drawn, and their forms are moulded more perfectly. We even measure nature by what art has done, and commend her by epithets taken from art. We say of the stem of the pine or the elm, It shoots up like a pillar. We call the forest a "pillared shade." We say of a man, He stands like a statue; or, He is an Apollo, for graceful strength; She is a Venus, for beauty.

It alters the relations of time.

In *time*, also, the imagination has boundless range. It must represent all actions and events, as either *now*, *before*, or *after*, yet it can do as it pleases as to which shall be *now*, *before*, or *after*. Nature, in these relations, acts after its own laws and within its own limits. The imagination can override them all, and accordingly she can make Puck "put a girdle round about the earth in forty minutes," and Uriel "glide on a sunbeam," "swift as a shooting star."

It creates mathematical entities. In Geometry.

§ 347. There are also special creations which the imagination forms and constructs, of which space and time are assumed as the only required conditions. Let all material existences be conceived to cease to be, leaving only an empty void within any limits which may be supposed, and in that void which is feigned, the imagination can construct the surface with its ever-varied outlines, and the solid of every conceivable form. These are purely mental constructions, and exist only for the mind and by the mind which forms them. Their form may be suggested by certain material things with which we are conversant. The uneven sides of material solids may prompt the imagination to conceive an extended surface that is perfectly plane or even. The irregular edge which is formed by the junction of two uneven sides, may excite it to conceive the mental line that is "the shortest distance between two points." The material may suggest the mental solid, which the imagination frames. But the *line*, the *surface*, and the *solid* constructed by the mind, are far more perfectly drawn and moulded than

nature has ever furnished in material objects, or than art has imitated with material instruments.

Should it be conceded that these creations of the imagination are not the ideal point, line and surface with which the mathematician is conversant, they certainly quite surpass the coarser products of nature and art.

These constructions can be combined and divided by the same power that forms them. Thus, an imaginary line can be prolonged, imaginary surfaces can be adjoined, imaginary solids can be piled together, without limit in direction or form.

The imagination can also sweep all actual events and phenomena from the line of time, and then plant along its course the shadows of events that shall only symbolize or represent its successive intervals or instants. It can also group and combine these as it will. Real events, as they precede and follow one another, may incite to these acts of pure construction; but the acts and the products which they excite and suggest are to be referred to the creative energy of the imagination. What relations these hold to the distinctions of number, will be discussed in the proper place (§ 561).

In arithmetic and algebra.

§ 348. (2.) In the world of matter, the imagination can create no new material, but it can divide and combine the parts of the material things with which it is familiar, so as to form new existences.

The head and trunk of a man it can fit to the shoulders and body of a horse. It can form a mermaid—part woman, part fish. It can provide men, women, and children with wings, and turn them into angels and cherubs. It can represent any animal with a human head. It can add to the head of a man the ears of an ass, and give to another the mouth and nose of a puppy.

It can connect the part or the whole of any plant with the part or the whole of any animal, making a cabbage to sprout from the hump of a camel, or a rose-branch to nod from the head of a horse, as we see delineated in some quaint pictures and engravings.

It can recombine and rearrange the parts of inorganic things as it will, making a rock to be balanced upon a roof-ridge, and a bridge to stand dry in a desert. There is no limit to the grotesque and fantastic combinations which can be made with the parts and the wholes of material objects.

Though the imagination cannot invent a single new sensible or material quality, it can connect such qualities as nature has never combined, making flaming red dogs, bright yellow oxen, woolly horses, talking mules, musical jackasses, golden mountains, rivers of wine, ponds of beer, and fountains of hot coffee.

§ 349. (3.) In respect to spiritual beings, the imagination is limited by similar constraints and invested with a similar freedom. A spirit has no visible or extended parts; therefore, as a spirit, it cannot be divided and recombined; but a spirit may be connected with any kind or form of matter, may be imprisoned in trees, may animate a cloud, may dwell in an animal form, or "leap like Minerva from the head of Jupiter!"

It can combine spiritual beings with wholes and parts of matter.

Not a single new spiritual capacity can be invented or imagined. The

loftiest and the purest of spirit-creations simply feel, desire, and will. The humblest and the most degraded can do no less. We cannot invest the highest archangel with any endowment other than these. We cannot refuse to the lowliest animal some poor analoga to some of these functions.

Imaginary intellectual and emotional creations. In respect to the limitations and the conditions of the exercise of the intellect, the imagination has the widest range of creative power. It can conceive the intellect of a God that creates all that it discerns, and discerns whatever it creates, without condition or process, by an all-penetrating and all-comprehending intuition. It can also imagine the intellect of an idiot, struggling to free itself from the gross obstructions of a diseased body, and fixing its painful attention in the first beginnings of knowledge.

In respect of feeling, it can, on the one hand, imagine pure love glowing with the energy of seraphic fervor, or simple hatred raging with fiendish malignity; and, on the other, the most imperfect and feeblest actings of either.

There is no limit to the variety of spiritual beings with which the imaginary world can be peopled, nor to the variety of the conditions of being and acting to which they can be subjected. The graceful Titania, with her frolicsome and mischief-making fairies; the hideous Caliban, in body and spirit the very contrast of the wonderful Miranda; Satan and Abdel; are examples of the variety of spiritual creations which the imagination can construct out of its limited materials.

Products under thought-relations. § 350. (4.) We have seen that the imagination cannot step without the charmed circle of thought-conceptions and relations. Some of the examples of what it can do within that circle by newly conjoining attributes of material and spiritual beings, have already been given. It cannot conceive of beings, except as substances and attributes, but it can join any attribute, of any intensity and compass, to any substance. It cannot break them from that connection which binds all real beings and events as causes and effects; but it can make any existence to serve as the cause of any other as its effect, and thus can reverse the whole order of actual being by its capricious and fantastic combinations; or it can enlarge the bounds of science by its happy suggestions of undiscovered powers and laws, and the appliances of art by applications before unimagined, of familiar agencies to new results. All things in the world of fancy must be conceived as fitted for some end, but the adaptations may be imagined as wildly as the caprices of a madman's dream, or as wisely as the perfect fitness which we believe has been arranged by the All-wise God.

How does the imagination create? § 351. With this view before us of the materials to which the imagination is limited, and of the products into which it transforms them, we are prepared to inquire, *third*, How does the imagination effect these changes; or what is the precise work which the imagination performs in its creative function? It might be deemed sufficient to reply, The imagination produces or creates these products from the materials, and laws of nature; it does all which is necessary to effect these changes: it is enough that the imagination por-

forms this work; it can do all that its creations show it is able to perform; we interpret its function and its capacity by the results produced. But while this suffices as a general answer, it is fair to ask, more particularly, What are the principal differences which we discern between the products and the materials from which they are formed, and what do we thence infer as to the capacities of the creative power? We observe, in answer to these inquiries, There are three different acts in which its creative power is shown. (1.) The imagination can recombine and arrange the constituents of Nature in new forms and products. (2.) It can idealize and apply the relations of objects to extension and time. (3.) It can form and employ an ideal standard for the intensity and the direction of the activity of natural or spiritual agents, and for the material objects and acts which symbolize them. We will consider these acts in their order.

1. *The combining and arranging office of the imagination.*

§ 352. The examples already cited both prove and illustrate the fact, that the imagination very largely acts in the way of reuniting and rearranging the materials furnished to experience, and they also suggest the limitations under which this function can be employed. It is obvious, also, that the so-called parts of objects, and objects treated as parts, are as minute and numerous as any species of analysis can separate. The terms *parts* and *wholes*, are, as we have already seen, relative, changing with the objects to which they are applied, and the special design with which they are used.

There are sense-parts and sense-wholes, representative-parts and representative-wholes, and thought-parts and thought-wholes. A whole, as a building or tree, may be a part of the landscape with which it is connected; while it is still a whole with respect to its doors, windows, roof, etc., and whatever else makes it quantitatively complete. This is an example of the sense-wholes and sense-parts. Again, the several properties or relations of the dwelling or the tree, its form, dimensions, color, smell, etc., are thought-parts, which can be combined into new wholes, by taking away and adding, as we have already seen. If these new wholes are individual, they are formed from representation; if they are generalized, they are the work of thought proper, or logical wholes in the larger sense of the word. The synthesis of the creative imagination reaches as far and is applied as widely as the analysis of sense and thought can go. The imagination may reunite into varying products all that perception and consciousness separate or distinguish, and under every one of the relations in which they apprehend their objects. These relations are its only limits and laws.

That the imagination exercises this function of recombination, has been abundantly illustrated in our previous examples; indeed, this is conceded by all writers. The only error or oversight which we notice is, of those who limit its office entirely to acts of this kind. Thus, Hamilton says: "Now, in the first place, the terms *productive* or *creative* are very improperly applied to imagination, or the representative faculty of the mind. It is admitted on all hands that imagination creates nothing—that is, produces nothing new; and the terms in question are, therefore, by the acknowledgment of those who employ them, only abusively applied to denote the operations of Fancy, in the new arrangement it makes of the old objects furnished to it by the senses." (*Met. Lec. xxxiii.*) "As to what is called the productive or creative imagination, this is dependant for its materials on the senses, and on the reproductive imagination. The imagination produces—the imagination creates nothing; it only rearranges parts, it only builds up old

materials into new forms; and, in reference to this act, it ought therefore to be called, not the *productives* of creative, but the *plastic*." (*Lec. XLV.*, of Stewart, p. 1, c. iii.; c. vii. § 1.)

So far as this single function is concerned, this may be taken as a correct account of it, with a single qualification. The recombination and rearrangement which the imagination performs are purely mental operations, and the products are mental. The materials taken by it in hand are the mind's representations of actual things, parts of things, of the beings of sense and spirit, and their acts and relations. These representations are, in their nature, more refined than the realities which they represent. They admit of ideal separations which things will not allow. The color cannot be separated from the form, in fact; assuredly certain colors cannot be parted in fact from certain other properties as they can be parted by the imagination. The unions effected by the imagination are such as the laws of real being will not allow. The incompatibilities which have been referred to, as hindering the combinations of the imagination, are fewer than those which obstruct the union of real objects.

In simple representation, or the literal transcribing of real objects, there is involved something of what we call idealization. The simple image, if it should be said perfectly to reproduce the material or mental reality, would give it as an idea, and not as a fact of present experience. But in giving it as an idea or image, it always imperfectly represents it. In what is called simple representation, there is, therefore, always more or less of creation. No single object or event is or can be ever perfectly reproduced in all its properties and relations, with a full retention of each and of all in their original intensity. In every such representation there is and there must be separation and recombination by the creative imagination, the separation or elimination of those parts which are omitted, and the consequent union of those, and those only, which are retained. Those which are retained are often, if not usually, given in proportions and intensities which vary from the original. But the imagination has still other capacities of idealization which remain to be explained. We consider

2. *The idealization of the relations of space and time in the creations of art, and the constructions of mathematical science.*

§ 353. We have already referred to the fact, that the imagination, in every work of art, goes beyond, and outdoes the perfection and refinement of nature. The forms which sculpture moulds, and which, drawing outlines, are, as we have seen, more perfect than any which nature produces. Certainly they are more perfect than any which the senses can discern, or which nature can furnish as models. These constructions cannot be explained by any process of analysis, or selection of the parts of real objects, whether this analysis is called mental, or is performed by sensible instruments. The lines and shapes of grace which have been copied in marble or drawn upon canvas, in respect of delicacy of transition and ease of movement, far surpass those of any living being or actually existing thing.

They are suggested by, but are not copied from, any such beings or things. The story that the Grecian painter assembled from every quarter the most celebrated beauties, that he might borrow some charm from each, and combine all together in a perfect work, could never have been true. Stewart, indeed, asserts: "Milton would not copy his Eden from any one scene, but would select from each the features which were most eminently beautiful. The power of abstraction [analysis] enabled him to make the separation, and taste directed him in the selection. Thus he was furnished with his materials, by a skillful combination of which he has created a landscape more perfect, probably, in all its parts, than was ever realized in nature, etc." (*Elements*, P. I. c. vii. § 1). But this cannot be true, if Stewart refers to the images which were in Milton's own mind when he wrote. The separate features or parts of the finest scenes that Milton ever

It constructs
ideals of mathe-
matics and art.

These products
suggested by,
not copied from
nature.

witnessed, were in some respects inferior to those features which he imagines and describes. While it is true that nature, in some respects, far outstrips and surpasses what art can do, it is true, on the other, that the imagination, in her province, can go far beyond the attainments of nature. As we have already said, we even measure nature by some of the achievements of art. We apply the ideals of the imagination still more frequently to try and to test what spiritual achievement furnishes.

Geometrical and
arithmetical
quantities.

§ 354. We have already noticed those peculiar products which are employed in mathematical science, and which are known as geometrical and numerical quantities. These constructions cannot be produced by any process of separation or combination of the parts of material objects. In matter there are no points, lines, surfaces, solids, and spheres, such as geometry conceives and reasons of. The unequal faces of a material cube, the rough edges formed by two adjacent faces of a solid, the obtuse corners in which three adjacent faces terminate, are none of them these objects of thought, nor are they wholes from which these can be evolved or separated as elements or constituting parts. The line is not a part of an edge, nor the surface a part of the material face. If they were parts which could be separated by actual sense-perception from a whole, they must exist in that whole, or be distinguished as one of its material constituents (cf. § 345).

If it be said that these are distinguished and separated in the mind, that the process of analysis or abstraction is mental, it is still true that the mind can only separate what it first discerns. These objects cannot be discerned by bodily sense, nor can they be represented by simple imagination. They must be created by the mind, for the mind to behold, when the mind beholds them. Those writers who, like A. Bain, *The Senses and the Intellect*, and J. S. Mill, *Logic*, etc., and *Examination of Sir William Hamilton's Philosophy*, make these mathematical constructions to be apprehended by sense-perception and refined by repeated associations and experiences, will find no difficulty in adopting the theory, that the imagination forms these constructions by analysis and recombination. The difficulty with their theory is, that it does not provide and account for the facts. The senses cannot and do not apprehend these objects, neither as wholes, nor as parts of any wholes which they do discern. Nor can association or experience evolve them; for these, according to the theory in question, only elaborate what the senses discern. We are driven to the conclusion, by the very nature of the products, that the mind is endowed with the power to create what it seems to separate. These products do indeed represent some property or relation of a material object or event, and hence such an object or event may serve to bring them distinctly before the eye of the mind, as the imperfect material points, lines, and surfaces bring up or suggest their mathematical relations, but that which the mind imagines is this property or relation in a more refined and idealized form than can ever be realized in fact. These refined or idealized objects the imagination creates or forms for itself. It may be properly said to construct or to create them—first, in individual examples and applications, and then by rapid and easy generalizations. An individual point, line, surface, triangle, solid, sphere, are first constructed in relation to and by suggestion of a rude material occasion, and this is then generalized by the ordinary processes and conceived as resembling every similar creation, so that whatever is true of the one, is readily affirmed of all (§ 453).

What is true of geometrical, is true also of numerical quantity. Numbers symbolize the relations of objects contemplated in a series, as

constituting a whole, divisible into equal parts. In order to conceive of number, the mind must first view objects in all these relations. But in nature, so far as the senses can know, there are no equal parts constituting divisible wholes. Whether the ultimate molecules or atoms of matter are or are not equal, none such are discerned by the senses. The successive mental states which consciousness observes and by which it first apprehends and measures the successive portions of time, are none of them observed in actual experience to be equally long or short. All these must be idealized in the imagination before they are separated by its analysis and combined in its creations. We proceed to

8. *The formation of an ideal standard for psychical acts and states.*

The imagination idealizes psychical acts and states.

§ 355. The spiritual acts and states of which we are conscious, differ from one another in respect to the direction which they take—i. e., in respect to the objects on which they terminate, and hence to the quality of the affections—as well as in respect to the energy or intensity with which they are performed. But none ever reach a perfection in either respect which is so complete as can be conceived. Whatever or however we know, feel, or choose; we can conceive it possible to surpass what we actually do or experience. What we conceive as possible, is not remembered—i. e., represented—from what we have known as actual. We rise above and soar beyond the actual in the ideal which we imagine. By this we measure the attainments which we have in fact achieved. We propose that which is ideally possible as the standard which we aspire to make real.

Such a standard is the work of the creative imagination. It cannot be derived from the parts which we observe in ourselves or others, because the parts are no more perfect than are the wholes. It follows, then, when we perceive dimly and believe that we might perceive more clearly, or when we feel warmly or purely, or choose strongly and rightly, and our feelings or choices do not satisfy our tastes or our conscience, that we must create for ourselves an ideal standard of spiritual achievement. Such a standard, whether it be a standard of taste or a standard of duty, is the work of the imagination, that, in connection with and by relation to every psychical act which it performs or state which it experiences, is able to conceive of that which is more perfect and satisfying in respect to its object and energy. This may not be solely the product of the imagination. In the case of the ideal standard of duty, the mind believes it to be actually obligatory as well as ideally possible, but in the order of analysis and of nature, the imagination acts first of all, the fancy going before the belief or faith.

It expresses them by sense-objects.

§ 356. In respect, also, to the expression of these ideals in material forms, the imagination creates and applies the ideals which it always aims but always fails to reach. Whether the medium of expression be language—the language of gestures, of looks, of tones, or of articulate speech—or whether it be lines, or color, or solid form as employed by the draughtsman, the painter, or the sculptor, it is all the same. The use which we can make of the medium is never so perfect as our ideal of what is possible. As we have noticed

already, every such medium, physically regarded, falls short of the psychical perfection which we can conceive—i. e., create—in the mind. When this medium or material is required, not only to set forth an idea of simple outline, form, or color, but to represent another ideal of thought, feeling, and passion, then it is found to be doubly true that the ideals which the mind can frame, do, both as ideals and as expressed, rise above the reality which the voice or hand can execute. Hence it is that the ideal excellence of the poet, the orator, the actor, the musician, and the artist, are ever higher than his achievements—that the one flees before the other, as its shadow, and can never be overtaken.

The products of the creative imagination. What is an ideal?

§ 357. Our analysis of the several processes of the creative imagination has prepared us more exactly to understand and more precisely to define the nature of its *products*. The ideals of science and of art, of achievement and of duty, are, as we have seen, the products of that form of psychical activity which is properly called the creative imagination. It is *imaginative*, because the representative or imaging power is conspicuously prominent in its functions. It is *creative*, because there is no counterpart in nature from which its objects and products are literally transcribed or copied. It is to be observed, however, that imaging and images are not the sole elements in these processes or products. The imaging power, as such, is limited to the representation of the objects of actual experience, as wholes and as parts. The rational and emotional natures are absolutely essential to its existence and its exercise. There is properly no creative imagination in which the reason and the feelings are not conspicuous, and in which rational and emotional relations are not recognized and controlling. Its *creative function* is rendered possible by the union of the thinking power with the imaging power; the joint action of both resulting in these ideal products which address the intellectual and emotional nature.

The ideals are not images, but images viewed in limited relations.

It is to be observed, again, that the so-called images which the soul is said to create, are not pictures or transcripts from any sense-objects, or parts of sense-objects. The ideal line, surface, etc., of the mathematician and the artist, have never existed in fact. Nor are they *parts* of real lines or surfaces, *refined* or *divided* from them by the analyzing or abstracting power. The imagination, when it *creates*, does not picture or image to itself a line without breadth, or surface without depth; such a pictured line or surface are as impossible as real lines and surfaces would be. What, then, does the imagination perform when it creates its so-called *ideal* surface and line? It pictures or images a line with actual breadth and a surface with actual thickness, and contemplates them in certain relations to that space, which is the condition of their existence and of their being conceived as realities. The power to isolate this single relation—one or more—of the thing or its image, is that which enables the imagination to create the ideal line and

surface. But the power to know space as a condition of extended matter and to apprehend existing or imaged beings as holding relations to space, and to isolate one of these space-relations, is attained only when the mind has been developed by the generalizations of thought. The ideals of the mathematical imagination are only possible to the imagination when it has been disciplined by thought. One chalk or pencil line is narrower than another, one of the laminæ of mica is thinner than another. As we divide these lines and cleave off these laminæ, we seem to approximate to the ideal line and the ideal surface, simply because the senses and the imagination are less distracted and occupied with sense or imaged properties. The imagination selects, therefore, the line or surface whose thickness is least obvious to the senses, to suggest or represent the sole relation to space with which the intellect is for the moment concerned; or, which is even more satisfactory, it takes for a point an object whose dimensions are the smallest discernible to the senses or picturable to the imagination, and considers it simply as moved or movable directly to another point like itself, and thus *constructs* in the imagination the mathematical line. That is, it begins with an object or an image as far removed from sense as possible, and uses it so as to suggest the various relations which extended matter holds to space; or, to speak more exactly, to other matter extended in space. By the imagined motion of this line, it proceeds in a similar way to construct the surface, etc., etc. The nature of the act and the character of the product, in all these cases, depend on the intellectual apprehension of the relations of material—i. e., of extended objects, to space. The approximation of the actual to the ideal line and surface, consists in the more facile suggestion of the relations in question, by means of one rather than the other.

The ideals of the
artist; and in-
ventor.

The *ideal* of the *artist* depends on the relations of outline, form, color, etc., etc., to æsthetic pleasure; whatever may be its sources and kinds. He brings the lines, the model, the picture, as nearly as his materials and skill will allow to a condition in which there shall be no drawbacks to the pleasure and effect which are sought for. As long as a single distracting or inconsistent feature or property is prominent, so long is his ideal unreachd. As this will always be the case from defect of materials or defect of skill, so long will it be true that he can never make his work absolutely perfect, and that his ideal of what he imagines might be possible, will never be reached.

The *ideal* of the *inventor* is some agent, or combination of agencies, that are freed from the limitations which pertain to ordinary machines or instrumenta. These he illustrates to himself by fondly and sometimes obstinately conceiving of his model only in those relations of adaptation and capacity which he knows it to possess, and overlooking or denying other limitations to which it is liable.

Psychical and ethical ideas. The ideals of *psychical* and *moral attainment* suffer under limitations of another sort. With certain powers given in the actual, capable of results which are in fact achieved, and of good that is in fact enjoyed, we fix our attention solely upon the single capacity in question, without regard to the limitations which in fact interfere with its achievements. By selecting the most satisfying example of the actual which we can find, we fix our attention upon those relations which we desire to contemplate, and withdraw our attention from its defects and limitations, till it stands before our mind as an ideal example of the psychical power or the moral excellence which we wish exclusively to contemplate.

If the ideal excellence is contemplated as an attainable end of our being, or is enforced by the authority of conscience or the will of the Supreme, then that which was a conceivable ideal is viewed in still other relations. It is accepted as real: that which was an ideal of the imagination is believed to be a fact. But whether these ideals do or do not represent realities, the process by which they are created into psychical products, and the products created, obey the same psychological laws and involve the same psychological relations.

The result of this analysis is but another illustration of the interdependence of all the powers upon one another, and especially of the higher functions of the imagination upon thought and reason. It enforces and explains the near affinity of the imaging with the thought-power. It also indicates the advantage which language and music may have over painting and sculpture in expressing and suggesting what color and form cannot convey (cf. § 365).

Ideals founded on and related to individual experience. § 358. These truths also enable us to understand and explain how it happens that all ideas, however refined and elevated, are in some sense founded upon and related to the actual experience of each individual. A person born and nurtured upon a plain, who had never seen a hill or a mountain, can scarcely imagine the charm to the eye and the excitement to the mind which such scenery imparts, and would be quite incapable of creating ideal pictures suggested by such materials, or even of appreciating them when framed by others. One who has never been upon the sea, can neither picture to himself, nor to others, the wild sublimity of an ocean tempest. The Oriental, basking in the heat of an equatorial sun, and always surrounded by the fruits, the foliage, and the flowers that such a sun alone can nourish, cannot form an ideal picture of an arctic winter. Nor can the Scandinavian, out of the pale sunlight of his brightest days, or the most luxuriant vegetation of his starveling summer, construct an adequate representation of the exuberant life, and the glowing intensity of a tropical landscape.

The actual life of every painter and every poet, in the materials which it furnishes, must largely determine the direction and characteristics of his imaginative power. From the

writings of Dante, of Milton, of Scott, and of Bunyan, as well as from the pictures of Raphael and Murillo, of Gainsborough and Wilkie, one can easily conclude as to the place of their birth, the kind of education which they received from the books, and men, and scenery with which they were conversant. Not more decisively does a Japanese or Chinese drawing reveal its nationality, than do the workings and the works of the imagination enable us to interpret the experience and observation out of which this imagination has grown. The ideal world of every great artist, however high it may tower, or however largely it may partake of the gorgeousness of cloud-land, must be built of the idealized materials of his actual life and history.

The imagination
is capable of
growth and cul-
ture.

§ 359. It follows that the imagination is capable of steady growth, and requires constant cultivation. The creative imagination, when most gifted, can at first only rise to a certain height above the materials which its experience gives. Its succeeding essays are founded upon those which have been made before, and it proceeds by successive steps, more or less long and high, till it attains the most consummate achievements that are ever reached by man. That there is a striking diversity of original endowment, cannot be doubted; but that this is the common law of the development of this power, cannot be denied. It is shown to be clearly true from the nature of the power itself, as well as from the history of those who have been most distinguished for their achievements in poetry, fiction, and art.

The imagination
accompanies all
the psychological
acts.

This training and growth are not, however, occasional, but constant; they are not the results of separate efforts, which are consciously directed to some definite ends of creation, but are the consequents of an activity which is spontaneous, irrepressible, and often excessive. No impression can be more untrue than that the ordinary activities of this power are simply to represent and transcribe, while it is by occasional sallies that it idealizes and creates. On the other hand, it will be found to be true, that, even in its apparent transcriptions and its most faithful and vigorous efforts to recall and reproduce, the creative activity is ever ready to intrude. In the person who is distinguished as idealistic or imaginative, the creative power is always active, and often overbears and displaces the clear insight, the fixed attention, the calm and patient reflection, which are required to apprehend and recall the actual with literal accuracy. Indeed, in all minds the creative imagination mingles more or less prominently with the other mental operations, always modifying and sometimes greatly disturbing the acting of these powers and their results. In sense-perception, the imagination too often selects for itself what it will see or hear, and brings a report accordingly of what it thinks it has seen and heard. After the desires are grown strong and the character is fixed, the shaping spirit of the imagination enters largely into the perceptions as a modifying influence. In the observations of consciousness, and the reports which it records of what it has seemed only to observe, the same influence and the same effects may be traced of its creative energy. The observation and the record are both disturbed by the power to notice what we are anxious to find, and to leave unobserved or to imagine that we cannot see, what we do not wish to find to be true. In the act of recalling for ourselves or communicating to others, what we may have actually observed or experienced (even supposing the original observation to have been correctly made), the creative imagination often intrudes, consciously or unconsciously, biased by the desire to please ourselves or our fellow-men. The frequent and strange untrustworthiness of the memory, can be accounted for only by the selecting or idealizing activity of the imagination, when it seems to be simply recalling the actual past. Inasmuch as the thought-power, in its various acts of

reaching general conceptions and conclusions, chiefly depends on the fidelity of the representative power in reproducing the actual; whenever it creates instead of recalling, all the results of thinking must be disturbed. In this way the imagination may and does enter very largely into the acts of generalization, inference, and deduction; disturbing and misleading all.

§ 360. More generally we may say, this creative power is developed at the earliest period of our existence, and is busy in all ages and conditions of our human life. Childhood, in some of its aspects, is the most literal and the most observant of reality; yet even then the shaping activity of the imagination is always busy, filling the real world with another world of fancies and dreams. The most trivial and unsuitable objects are sufficient to excite its action. The rude and unfinished toy is more acceptable to the child than the mere costly and elaborate, because it leaves more room for the constructive power. If it furnishes resemblances enough to act as points of support to stay and steady the imagination, it is all the better if the greater part of the work is left for this to complete and supply. The sports and plays of childhood are little romances, prompted and acted over for the simple exercise and delight of the imagination. In later years the imagination is ever busy, not only in the occasions which are set apart for the exercise of its functions, but quite as much at times when the mind seems to be intent only on real objects, and engrossed with what are termed its ordinary and practical avocations. The interest which each man takes in the position in life which he holds or aspires after; in his employments, his friends, and associates; or the dislike and disgust which he conceives for each and for all, arises from the ideal lights with which the imagination invests them. The eye of the painter looks every landscape into a picture, and idealizes every face that it beholds; the lover "sees Helen's beauty in a brow of Egypt;" the day dreamer and the lunatic convert actual realities into visions, or visions into realities; the poet is, by the very appellation, recognized as a creator of beings that have not existed before.

Lovers and madmen have such seething brains,
Such shaping fantasies, that apprehend
More than cool reason ever comprehends.
The lunatic, the lover, and the poet
Are of imagination all compact.
One sees more devils than vast hell can hold—
That is the madman: the lover, all as frantic,
Sees Helen's beauty in a brow of Egypt:
The poet's eye, in a fine frenzy rolling,
Doth glance from heaven to earth, from earth to heaven,
And, as imagination bodies forth
The forms of things unknown, the poet's pen
Turns them to shapes, and gives to airy nothing
A local habitation and a name.

A Midsummer-Night's Dream. Act v.

Nature educates
the imagination.

§ 361. We may almost say that Nature herself is imaginative, or at least that by some of her aspects she prompts and quickens the training of the imagination. When she softens the distance by her interposed atmosphere, or gives unreal and picturesque effects by her wizard mists, when she gilds the horizon with the unnatural lights of the breaking morning, or enwraps it in the glorious pomp of a splendid sunset, she institutes contrasts which cannot but be noticed between a scene in its common aspects and every day garments, and the same when it puts on ideal appearances and wears its holiday attire.

This constant activity of the creative power explains its rapid growth, and its development into the capacity for sudden and surprising achievements. This education must, from the necessity of the case, be in great measure a self-education; it must be confined to the individual himself, and be conducted by processes that can be watched by no eye but his own, and issue in products that are known only to himself. There is no part of the mind's activity, also, of which it is so shy to communicate. Its secret ideals, its private romances, its vague

and aimless reveries, its fond imaginings, its aspiring and audacious dreamings, are guarded with the most jealous care. And yet, upon these concealed activities every man expends a large portion of his active energy.

The educated imagination meets the exigencies which call it forth.

§ 362. When an occasion calls for the manifestation of the power thus trained and matured, it acts as by the force and with the promptness and precision of apparent inspiration. Whether the exigency be that of the artist, the poet, or the inventor, the creative power formed by the ceaseless activity of years meets its requirements from the resources that it has been gradually providing. These resources may consist in part of the countless creations which it has shaped in connection with its perceptions and reveries, and which are again summoned back by the memory when first these images are needed. In such a case the imagination does not so much create anew, as fall back upon the unknown and unnoticed store of its previous idealizings. As the painter, when called to compose a landscape, can supply some needed feature by recalling a study which his pencil had previously sketched at the sight of some suggestive object, so the writer in the excitement of composition, or the speaker in a burst of unpremeditated eloquence, can avail himself of a striking figure that was originally suggested in a calmer mood—not composing so much as recalling. Or, the resources brought to the exigency may be the dexterity which has been acquired by use, and which dexterity consists in the power of so controlling the associating power that it shall yield the very materials which are wanted for the imagination to work upon, and in having so matured the creating power that as soon as it knows what it needs, it can create out of these materials the ideal which it requires.

In no other way can we explain the rapidity, the precision, and the success with which the constructing and inventing power seems to act when it is tasked to its utmost energy and produces its finest results. So startling is this energy even to its possessor, so ample are its resources, and so wonderful are its products under the excitement of strong feeling or determined motives, that its workings are more fitly compared to inspiration than those of any other endowment of the soul. But the rapidity and force of the unconscious actings of the soul in all its functions are phenomena which never cease to surprise and astonish us. We are now prepared to understand the

Special applications of the imagination.—(a.) The poetic imagination.

The imagination modifies and is modified by the other powers.

§ 363. The fact has been noticed, that the creative imagination is present by its actings with all the other powers of the soul, and determines the character of their products. We have also seen, in our analysis of ideals, that the converse is also true. All these powers are present in varied proportions and energies in those activities which are recognized as the acts of the imagination, and give a varied character to what are called its products, whether they appear in the form of poetry, fiction, the fine arts, or philosophy.

The poetic imagination.

Of these, the poetic imagination is the most interesting, and invites to a special analysis. Poetry may be defined, that use of the creative power which is employed for the gratification of the emotional nature in the production of pictures more or less elevating in their associations, which are fixed and expressed by means of rhythmical language. When the ends are for mere amusement, and the associations under which they are present, and the emotions which they excite, are not especially ennobling, the poetic imagination is, in the language of later critics, called the *fancy*. When the aims are higher than simple gratification, and therefore involve more elevated associations

and feelings, it is dignified as the imagination by eminence, or *the imagination*. The adjective *imaginative* follows very closely this higher sense of the word.

The sources or materials of poetry. The sources from which the poetic power derives its materials are as numerous and extensive as the universe of matter and of spirit, and yet but few of these materials subserve the proper aims of the poet. While the poet may lawfully appropriate truth of every kind, provided it serves his purpose, yet it is preëminently that truth which holds or may be made to assume some relation to man which is of use in poetry. Mere pictures, as pictures, however varied and beautiful they may be, scarcely become poetic even for the fancy, unless some human interest or relation belongs or is imparted to them. The incidents of human life, or the feelings of the human soul, must somehow enter into the scene, or the truly poetic interest is wanting.

This human truth, which these pictures suggest, illustrate, or enforce, must be that which is within the comprehension and reach of all men. It is not the truth of the schools, nor of any special and limited society, nor that which is capable of being conveyed in abstract or technical words or understood by a select few after a special training, but it is the truth which is open and intelligible to all men (upon certain impliedly and easily recognized conditions). This is the first of the three characteristics which are recognized by Milton in his brief description of poetry as "simple, sensuous, and passionate."

Poetry should indeed be *simple*, because its products are designed for the use of all men; and its images, thoughts, and words should be easily comprehended by all who have attained certain advantages of culture, and have been trained to a certain degree of thought and feeling. It should also be *sensuous*—that is, it deals with images, not with generalized and scholastic language. It presents pictures to the mind's eye, not refined and subtle reasonings to the thought-powers. It introduces action into every scene. It is eminently concrete and picturesque. It should also be *passionate*—i. e., its simple and pictured truth should come from a soul that is animated by warm and elevated emotions. The presence of feeling as a requisite of all that composition which is called imaginative, is not always recognized so distinctly as it deserves to be. Without feeling, and, in general, without feeling of a higher kind, the mere power to create is of little worth, and its results are of little interest. Indeed, without it the power will not be so matured into a predominant energy, or be so regulated, as to become a ready instrument at the service of its possessor. But with it, the creation of the kind of pictures in which the emotions delight, becomes a pastime and an occupation, and poetry is to the poet its own "exceeding great reward." Inasmuch as only the higher emotions act with a steady and intellectual pressure in the refined occupation of poetic culture and composition, the images which association presents and the imagination detains and reconstructs, are of an elevated character; they assume the lofty and ennobling character of ideals in the better sense of the word. Hence it becomes so generally true that poetry is almost necessarily elevating in its nature and influence. Hence it has been held to have something in it that was divine.

"Therefore, because the acts or wants of true history have not that magnitude which satisfieth the mind of man, poesy feigneth acts and events greater and more herocal; because true history propoundeth the successes and issues of actions, not so agreeable to the merits of virtue and vice, therefore poesy feigns them more just in retribution, and more according to revealed Providence; because true history representeth actions and events more ordinary and less interchanged, therefore poesy indueth them with more rareness, and more unexpected and alternative variations; so it appeareth that poesy serveth and conformeth to magnanimity, morality, and to delectation. And therefore it was ever thought to have some participation of divineness, because it doth raise and erect the mind, by submitting the shows of things to the desires of the mind; whereas, reason doth buckle and bow the mind unto the nature of things. And we see that by these insinuations and congruities with man's nature and pleasure, joined also with the agreement and concert it hath with music, it hath had access and estimation in rude times and barbarous regions, when other learning stood excluded." (Lord Bacon, *Advancement of Learning*, B. II.)

Poetry, in its higher forms, unites and fuses.

The poetic imagination, in its higher forms, is often described as a fusing and unifying power. It subjects all its materials to single and commanding objects. It unites and blends them under the overmastering power of some controlling passion or commanding purpose. It fills up the field of view with images appropriate to its thoughts and feelings, everywhere seeking and everywhere finding something relating to its controlling sentiment or purpose. It turns inanimate things into living beings. It invests them with the attributes, and imparts to them the feelings which are congenial to the thoughts and aims which are all-engrossing to itself. These phenomena are not characteristic of the poetic imagination as an image-making power, but are to be ascribed to that peculiar elevation of feeling and consequent quickening of the intellect which enters so largely into poetic genius, and which prompts to its creative power.

In its lower, it separates and scatters.

When the image-making power simply plays or sports with images for their picturesque effects and the amusement which they give—when its ends are amusement or illustration only, it is called *the fancy*, which abounds in images, indeed, but lacks the loftier attributes of the higher imagination. Fancy scatters and relaxes the attention, rather than concentrates and holds it. It pleases rather than elevates; it relaxes and weakens rather than gives tone and energy. It passively submits to the disposal of the objects which surround it, rather than disposes them at its will, and subjects them to its control. It is borne hither and thither at the capricious suggestions of the objective world; *the imagination* by the force of its strong emotions subjects these objects to itself, and makes them seem to be what it wills.

Its medium is language.

It is peculiar to the poetic imagination that language is its medium. It is not essential that this language should be metrical; though a rhythmic movement, and the regular return of similar syllables in measured accent heighten greatly its effects. The poetic power is also shared by the novelist, the dramatist, and the orator. But poetry must always employ language, and in this respect it essentially differs from painting, sculpture, and even music. Painting and sculpture create images indeed, but they fix them permanently upon the canvas or embody them in marble. But poetry can only suggest them by words; it portrays its images only, as by words it awakens in the imagination of another images similar to those which the poet himself conceives. If the imagination that receives is feeble, slow, and perverse, it is in vain that the poet tries to excite it to follow his lead. But if it is strong, quick, and sympathizing, it may be aroused by the words of the poet to finer creations than even the poet himself has known. The suggestive power of words gives to the poet a marvellous advantage in the greater breadth of his field and the variety of his effects. The painter and sculptor apparently present all their work to the eye. It is true that this work is better appreciated by one eye than another. In one sense it takes an artist to interpret an artist; but even with this allowance, the range of the indications is narrow, and the possibility of manifold suggestions is limited. But words have a capacity to suggest more than they directly convey, and hence to take up into their import a multitude of pictures according to the variety of uses to which they are applied. The word whose literal import is prosaic, trivial, or mean, when used by genius in a new application, becomes poetic, picturesque, and elevating. The material which in common use is cold, conventional, and dry, has power, by dexterous combinations, to awaken delightful imagery, and to kindle exalted associations. In this way language itself becomes permanently enriched and elevated by the fact that it has been employed by men of poetic genius.

(b.) *The philosophic imagination.*

Relations of the imagination to thought and action.

§ 364. The relation of the imagination to thought has been the subject of much discussion, and has given rise to no little diversity of opinion. Many have contended that its influence is unfavorable to the operations of the intellect in the discovery

of truth; that it distracts the attention, biasses and misleads the judgment, and disqualifies for any of the reasoning processes. On the other hand, the fact is undisputed that the men who have been most distinguished in philosophy, especially as discoverers or inventors, have been remarkable for reach and glow of imagination. Indeed, we may safely say that in the history of speculation and science not a man can be found who was distinguished for philosophic genius who did not possess an active and a glowing imagination, and whose imagination did not render essential service in the operations of thought. Striking examples of the combination of the poetic imagination with eminent philosophical genius are numerous. We name *Plato, Kepler, Galileo, Bacon, Newton, Leibnitz, Davy, Owen, Faraday, and Agassiz*. A moment's reflection will show that this must necessarily be true. The objects of present observation must always be limited in number. They must reappear in the form of representations. The facts with which the philosopher has to do must come to him in the form of images, when he would discern their various relations and subject them to the processes of thought. It is important that these should be readily presented. This can only happen when the associative power is wide in its range of relations, and quick in its action. These qualities almost invariably accompany, if they do not necessarily involve, great energy of the creative power.

Relations to invention and discovery.

But whatever may be thought of the relations of a vivid imagination to the memory, as furnishing the materials for the philosopher, there can be no question that to invention it is entirely essential; indeed, that, without an active imagination philosophic invention and discovery are impossible. To invent or discover, is always to recombine. It is to adjust in new positions, objects or parts of objects which have never been so connected before. The discoverer of a new solution for a problem, or a new demonstration for a theorem in mathematics, the inventor of a new application of a power of nature already known, or the discoverer of a power not previously dreamed of, the discoverer of a new argument to prove or deduce a truth or of a new induction from facts already accepted, the man who evolves a new principle or a new definition in moral or political science—must all analyze and recombine in the mind things, acts, or events, with their relations, in positions in which they have never been previously observed or thought of. This recombination is purely mental. If there be a discovery or invention, there has never before been such a juxtaposition of the materials nor of their parts in the world of fact or in the thoughts of men. These objects and parts are now for the first time brought together in the mind—*i. e.*, the imagination of the discoverer. Every discovery is, in fact, a work of the creative imagination.

It is true the power of thought must attend the operation. Unless the representations and combinations are made and regulated with reference to the ends of thought, they will be

made in vain. But the range of these pictured objects must be wide; every one of them must be vividly conceived, that all the attributes, and analogies, and relations may come before the eye of the mind. The more vividly this presentation is made, provided the processes of analysis and comparison go on with equal energy, the wider is the field of discovery and the greater is the chance of success. We have already observed that there are as many forms of memory as there are distinguishable types of mental activity; that whatever the mind is apt and active to apprehend, it must necessarily be quick and faithful to reproduce. By the same rule, whatever be its power to analyze and recombine, it must be able with the greater facility, to imagine as analyzed and readjusted, the imagination following the measure of the mind's presentative power. There are as many forms of imagination as there are forms of creation or invention. Whatever the mind can part and unite with the original object before itself, it can also separate and combine with greater advantage when it is recalled as an image. The world of images is also far more plastic than the world of reality. Its materials come and go more quickly than real objects. More can be crowded at once into the field of view. The mental analysis and synthesis required, can be more rapidly performed upon the shadows which the mind summons to its service, than upon the things which it can slowly call up and slowly survey.

The poetical
and philosophical
imagination
nearly allied.

But there are special reasons why the peculiar type of the imagination which the poet requires is closely allied to that which gives genius to the philosopher. To the higher imagination, as required by poets and orators, there is always requisite the power to interpret the indications or analogies of the beings and phenomena which they observe. The resemblances which the imagination is quick to notice and to apply to the ends of metaphor and passion, are more or less nearly allied to those powers and laws which philosophy seeks to develop and establish. Every poetic metaphor that is worthy to be so called, is founded on some truth of reason, and serves to indicate some power or law. The intensity of interest that fixes and holds the mind in the patient attention of the philosopher is closely allied to that strongly absorbed and controlling enthusiasm which holds the poet to the images which his fancy summons or creates. Both dwell in such a world with an enthusiasm which is not easily understood by others. That which maintains the interest of each, is the passion of each for the image-world which he re-creates. That which gives to each his mastery over this world, is the familiarity which results from long-continued practice in calling up its objects and in moulding them at his will. Such a mastery, arising from such a continuity of effort, can only be attained by that passionate interest which is the secret of genius, whether genius labors for the ends of scientific or poetic truth; whether the end for which it labors is the truth of science that addresses the intellect, or the truth of feeling which controls the heart.

Objections to this view. The objection will still be urged, that the exuberant and passionate imagination may, by the attractiveness of the imagery which it creates, withdraw the mind from the soberness of scientific truth; that what might be gained in

the abundance of material and the vivacity with which it is brought before the mind, is more than counterbalanced by the distracting and bewildering influences which follow. Or at least it will be said, the poetic imagination will fill the mind with delusive phantasms in the form of attractive theories, and forbid it to judge of its theories by the dry and severe light of reason. There may be danger here; but, on the other hand, where the imagination is poor and the analogies are few, the mind is narrow, prejudiced, and obstinate. The abstractions of science are personified into essential beings and actual powers. If the imagination tempts to excessive theorizing, it also precludes and prevents it, by the vivid sense of reality which it inspires, by the strong desire to illustrate and exemplify by some pertinent fact or appropriate instance, and by the readiness with which, from its abundant resources, it can bring them forth for all its occasions. There is no danger to science so serious and constant as that from an overweening tendency to abstraction, which fills the intellectual world with artificial hypotheses that have no ground in reality, and become the

Idols of their originator, and those who constitute his school. Against this tendency there is no correction so effectual as the honest and hearty realism of a vivid, active, and fertile imagination, when employed in the service of truth.

§ 366. *In the communication of scientific truth* there can be no question that a large measure of imagination is of essential service. He that would amply illustrate, powerfully defend, or effectively enforce the principles and truths of science, is greatly aided by a brilliant imagination. This, of all other gifts, delivers him from that tendency to the dry and abstract, to the general and the remote, to which the expounder of science is continually exposed from his familiarity with principles which are strange to his pupils and readers, and which need to be continually explained and illustrated by fresh and various examples. The philosophic writer or teacher who is gifted with imagination is more likely to be clear in statement, ample in illustration, pertinent in his application and exciting in his enforcement of the truths with which his science is conversant, whatever may be the subject-matter with which the science is concerned.

(c.) *The ethical imagination.*

Ethical relations
of the imagination.

§ 367. The *practical* or *ethical uses* of the imagination are numerous and elevated. These are sufficiently obvious from the single consideration, that the law of duty is and must be an ideal law: for whether it is or is not fulfilled, it must precede the act which reaches or falls short of itself. Every ethical rule must be a mental creation, an ideal formed by the creative power, and held before the soul as a guide and law. Asserting, as we do, that this law, in general, is the same in its import for all men—so that, in a certain sense, the imagination of every one must create the same general ideal rule, it remains true that the practical ideal of every one is peculiar to himself, and shared by no other person. This ideal, so far as the particulars of his character and life are concerned, may vary both in its import and in the vividness with which this import is conceived. What each man may become in this and that respect, in wealth, position, knowledge, power, etc., is the romantic ideal of youth and the pleasant dream of later years. The aspirations of endeavor, the visions of hope, and the romances of pure reverie which express more than we dare aspire after or hope to effect, are obviously the work of the creative imagination. If these are conformed to a just ideal of life and character, they are most elevating in their influence. If they are consistent with the conditions of our human nature and our human life, if they are conformed to the physical and moral laws of our nature, and the government and will of God, they are healthful and ennobling. Such ideals can scarcely be too high, or too ardently and steadfastly adhered to. But if they are false in their theory of life and happiness, if they are untrue to the conditions of our actual existence, if they involve the disappointment of our hopes, and discontent with real

life, they are the bane of all enjoyment, and fatal to true happiness. The brief excitement which these unreal dreams occasion, however highly wrought this excitement may be, is a poor offset to the painful contrasts which they necessarily involve.

Relation of
ideals to our
happiness. It is not what we actually attain or possess that makes us happy or wretched, but what we think is essential, or possible, or just for ourselves to attain. The ideal standard for ourselves by which we measure our attainments in all these respects, is that which has the most to do with satisfaction or discontent. It is of little consequence what a man has, if he imagines that he must have something more in order to be truly happy. He cannot be content if this is wanting; if he dreams that something more is justly his due, his discontent will be aggravated with a sense of injustice from his friends or his fellow-men; from society, from nature, or from God. If his ideal is rational and just, still more if his theory of life teaches him to find satisfaction in those sources of good which are open to all, in occupation, in worthy pleasures, and in the exercise and interchange of the social and kind affections, he cannot easily be robbed of content and happiness. If his ideal contemplates self-sacrifice, suffering, and evil, as possible conditions of good, he will be still more secure of a happy life. If it reaches forward to another scene of existence, and brings before him the blessedness of a character perfected by suffering and made fit for the purest and noblest society conceivable, his happiness on earth may even be augmented by disappointment, sorrow, and pain.

If, on the other hand, these ideals are factitious or unreasonable, they become the source of constant wretchedness. If a man to be happy, must be as rich or as fashionable, as successful or as accomplished as he dreams of, all his actual enjoyments pass for little or nothing till his ideal desires are gratified. These are the standard by which he measures his good. Without reaching this standard, he cannot be satisfied. While, on the other hand, the man who never aspires can never rise; while even romantic hopes and wishes have much that is quickening and elevating in their influence, it is equally essential that all ideals of happiness should be conformed to truth, and should propose objects that are approved of conscience, of the ordinances of nature, and the will of God.

§ 368. These ideals of life and happiness must involve a more or less positively ethical character. We cannot imagine what we are to be and to become in fortune and success, without including more or less distinctly what we ought to be in character and to perform in action. Even if our general ideal be conformed to the law of duty, our imagination in particular of what a virtuous man should be in feeling and in action, may be very imperfect, or even very false. It may overlook many real excellencies, and tolerate many defects, through ignorance, false education, and corrupt public opinion, or our own vicious tastes and inclinations. We may, in our imaginations, fall far below the elevation of a just ideal of what a man should be, to be courteous, self-sacrificing, patriotic, friendly, hospitable, gentlemanly, or even honest, veracious, and upright. But whatever these ideals are, whether they are false or true, elevated or low, they will be certain to exert a most healthful or a most baneful influence upon the character. They furnish a standard that is constantly present, and constantly active to lift us upward or to drag us downward. Hence, in a certain sense, what a man aspires to become, has *ethically* already decided what he is. His aims and

Ideals of life
necessarily ethical.

standard are the reflex of his wishes and his will, as well as the assurance of what he can achieve in the future.

Ideals of duty may be changed and improved. The ideal standard of duty may be constantly corrected and improved. From his own experience of the effects of acts or habits, or his observation of these effects in others, a man may supply what he has omitted to observe, or correct that in which he has erred, and so advance to a higher and more perfect rule of feeling, of manners, and of life. In this way a community may rise or sink, may advance or go backward. Every man, by his good life, by the realization of what is good in himself, and his more perfect manifestation of it in all appropriate and beautiful acts, may advance the ideals of others. The contemplation of fictitious characters, elevated and ennobled by ideal beauty, serves to quicken and enforce the ethical ideal of thousands of susceptible minds. The poet, the novelist, and the dramatist, quicken the fervor, and instruct the minds, and elevate the tastes of their readers. The ideals of a community or of a man, both express and form its ethical life, whether for evil or for good.

(d.) *Imagination and religious faith.*

Relation of the imagination to religious faith.

§ 369. The relation of the imagination to religious faith is interesting and important. The objects of our faith, by their very definition, have never been subjected to direct or intuitive knowledge. Neither sense-perception nor self-consciousness, have confronted them directly or brought report of them. And yet the imagination pictures these objects as real and most important. What are the materials which it parts and reunites? Whence the suggestions which it idealizes into more refined and spiritual essences? By what authority does it invest these creations with verisimilitude and impose them upon the assent of the intellect, as representing the most real and important of all truths? What analogies are there between the finite and the infinite which authorize the imagination to use the one to symbolize the other, and justify its faith in its own symbolic creations?

We must imagine as well as believe in spiritual facts.

Of the Divine Being—of self-existence, of unlimited power and knowledge, of creative and preserving energy, of forecast and providence, we have no direct experience. All our direct apprehensions of spiritual attributes and relations are of the limited only. It is by the limited that we reach the unlimited even in thought.

Conceding that we can conceive the infinite, can we also image our concepts? (§ 427.) We cannot. The sphere of the imagination is only the finite. All the pictures which it can construct are of limited objects. It is by means only of such pictures that it can image its concepts of the infinite, if it attempts to image them at all. That it attempts thus to image them, is evident. That it can adequately picture them, no man believes. What is embraced in the concept is the known likeness between the finite and infinite. What is pictured by the image, is some limited example of the thought-relation which the image suggests. These pictures may be increased in number, extent, or energy, but this is all.

Existence, power, knowledge, origination, foresight;—all these we say and believe are both finite and infinite. They are in some sense familiar

to our experience, and we conceive and know them. But when we seek to image them as infinite, we select some examples that illustrate these attributes; we choose an image from the finite to give life and reality to the concept of that which we believe to be unlimited in respect to its sphere and energy. The kind of existence and the manner of activity which we would image, we assume to be within our experience. As we have already seen, the materials at the service of the imagination when it has to do with spiritual beings, must come from our personal consciousness. But this consciousness has direct knowledge only of limited powers and acts. Independence of being, eternity of continuance, superiority to space, unlimitedness of power and knowledge, cannot be imaged by any thing which we directly know. They can only in a sense be approximatively imaged by an added number of the objects to which limited spiritual acts and attributes are related.

The process;
and its trust-
worthiness

When we use the imagination to image or illustrate our concepts and beliefs of infinite, spiritual being, we can multiply and enlarge the images of those finite objects upon which these powers are employed, and of the finite effects in which these infinite attributes are manifest. But these utmost efforts of the imaginative power to reach the infinite and absolute, are always attended by the belief that they fall short of the reality; that no enumeration of finite objects, however interesting in themselves, or significant they may be, are at all adequate to illustrate the divine; that no continuation of space or of time can express the divine eternity; that no quanta of dependent being can fitly represent the Being who is self-existent. To have the materials that shall enable a man fitly to image the infinite, one must himself be infinite. There are, indeed, analogies between the created and the creating spirit; else the one could not know the other in any sense or to any degree. But these analogies are too few and too inadequate to enable or authorize man to penetrate into the secret things which belong to God, or to make conceivable the divine by any images which man applies so freely and properly to limited things. The imagination is not easily content to use the analogies which are placed at its command, and to refrain from using those which it may not lawfully employ. It would fain go further than it can or ought. To do this, has been its constant temptation and its perpetual daring. To refuse to go as far as it may and ought, is weak and unphilosophical; but to attempt to go further, is always irrational, and, it may be, impious.

The imagination
limited in its
pictures of an-
other state of
being.

§ 370. In respect, also, to the capacities and experiences of the spirit in an unembodied or a disembodied state,—when separate from a human body or any material organization—the imagination is limited in the materials of its working and the products which it creates. Our knowledge is of the soul in its connection with the body, and of objects which are known through sense-perception. To image any of its acts or states without a constantly present background of bodily sensations, is to imagine a mode of existence that seems to us imperfect and unnatural. We cannot imagine the soul without the body by which to know and act, and without material objects to act upon. If we attempt it, we bring to our aid some attenuated matter for the soul's habitation and instrument, and we surround it with a world of objects that wear the forms of material things. It is not easy for us to

conceive, and therefore not easy to believe in a world of purely spiritual agencies and objects, without some intrusion of imaginations taken from the world of familiar life. But inasmuch as religious faith not only believes in God, but in another condition of existence for the soul unlike the present in the connection of soul and body and the instruments and objects of the soul's knowledge, the question continually presents itself, How far can we image that world by this, and the soul's experiences in that world, by its experiences in this? Can we imagine it at all? May we apply the pictures drawn from this life to illustrate or make conceivable the scenes and events of another state? We not only can, but we must, yet ever with the caution, that the images which we use be not allowed to suggest more than the data authorise. That world is like the present in certain particulars, else we could not conceive it at all.

Common relations in the finite and the infinite. § 371. There must be concepts which are common to the two, which serve as the bridge across which we pass from the one to the other. But the images by which these concepts are illustrated, must all be taken from the world of sense and matter, because, forsooth, it is only sense and matter that furnish images for spiritual facts and phenomena even in the present state of being. If all the language concerning spirit, even in this world, is taken from the facts and phenomena of matter, it must of necessity follow that such facts and phenomena, when placed in another sphere, must yield to the same law. If other facts and phenomena of the future state are to be conveyed in language which is at all analogous to the sphere of sense and matter, these must be set forth under images derived from the sense-conditions and the material things which are present to us here. It should not surprise us, then, to find that the imagination, when it rises into faith in objects of the unseen world, invariably uses pictures that are borrowed from the world of matter, and phrases all its language from materials furnished by this imagery. It cannot do otherwise. However lofty its conceptions may be, however soaring its aspirations, undoubted its beliefs, or ardent its hopes, all these must be pictured and expressed in the images taken from that world of matter which is adapted to a soul that knows and acts through a material organism. If there be a revelation that is conveyed by human language or addressed to the human soul, it must in this respect be accommodated to the capacities of the soul that is to understand and accept it. The fact that it must be conveyed by such a medium, does not disprove that a revelation is possible, or at all detract from its importance or authority. It cannot be argued against its divine origination or supernatural confirmation, that it conforms itself to the nature of the being to whom it is made. If man is to understand its import, that import must be expressed under the conditions and laws of human thought and of human language. If we must image the concepts of our own spiritual life, and of an extra-mundane sphere of being, by pictures taken from the material sphere, all communications to us concerning other spirits and other spheres of being must be made under this common condition and by means of this common vehicle, whether they are natural or supernatural, whether they are human or divine.

Necessary cautions in conceiving and interpreting revelation. If, on the other hand, we regard the necessary limits of imagination and faith, we shall not expect that either will do more for us than lies in the capacities of either. We shall not confound the images of analogy with the intuitions of direct knowledge. We shall not mistake the accessories of illustrative imagery for the realities of the concepts or truths which this imagery sets forth. We shall not revel in sense-pictures of the fancy, as though the sensuous in them were literal truth. We shall not be imposed upon by pretended seers, because, forsooth, their pictures of the unseen, are so minute, so copious, and so beautiful, or so confidently set forth; overlooking

the circumstance that these visions may be merely the residua of a too luxuriant fancy, or the creations of an excited and perhaps an insane imagination. The recognition of the human limitations in the divine, will teach us to interpret the divine aright, while it may save us from accepting as divine that which is only limited and human.

Upon the imagination, and its various applications, cf. J. Addison, *The Spectator*, Nos. 411, 412, 413, 414, 416, 418, 419; A. Alison, *Essays on the Nature and Principles of Taste*, Ess. I.; M. Akenside, *Pleasures of the Imagination*; E. Burke, *A Philosophical Enquiry* etc., p. v. secs. ii., iv., v., vi., vii.; D. Stewart, *Elements*, etc., p. ii. chap. viii.; Dr. T. Brown, *Lectures*, xlii., xliii.; Hamilton, *Met. Lec.*, xxxiii.; J. Ruskin, *Modern Painters*, p. iii. sec. ii.; S. T. Coleridge, *Biog. Lit.*, chaps. xiii.-xxii.; W. Wordsworth, *Appendix, Prefaces*, etc., *Poetical Works*, vol. vi.; Leigh Hunt, *Imagination and Fancy*; E. S. Dallas, *The Gay Science*; R. G. Hazard, *Essay on Language*; P. Brown, *Procedure*, etc., etc., *of the Human Understanding*; *Things Divine and Supernatural conceived by Analogy*; H. L. Mansel, *Limits of Religious Thought*; H. Calderwood, *Philosophy of the Infinite*.

PART THIRD.

THINKING AND THOUGHT-KNOWLEDGE.

CHAPTER I.

THOUGHT-KNOWLEDGE DEFINED AND EXPLAINED.

From *presentation* and *representation* we proceed, or rather we ascend, to a higher kind of knowledge, viz., *knowledge by thought*. Presentation gives us individual objects. Representation recalls them to the memory, and pictures them in the imagination. Both these acts and processes prepare them for the service and uses of thought, which gives generalized conceptions, permanent principles, and universal laws. In this part of our treatise we treat of the processes and products of thinking, or thought-knowledge; reserving for the part which follows, the consideration of the intuitions and relations which are directly assumed in thought, and indirectly in all knowledge.

§ 372. The third kind of knowledge of which the intellect is capable, is thinking, or thought. The term *thought*, when used in this special or technical sense, is applied to a great variety of processes, which are familiarly known as *abstraction, generalization, naming, judging, reasoning, arranging, explaining, and accounting for*. These processes are often grouped together, and called the *logical, or rational* processes; their mutual affinity and common relationship to the higher functions of the intellect, being acknowledged by this general appellation.

This affinity is more clearly seen in that they all assume and make prominent certain fundamental relations, such as substance and attribute, cause and effect, means and end, adaptation and purpose, power and law, with the several concepts which these relations involve.

It is more manifest and striking by the relation of these processes and conceptions to the higher knowledge and attainments of man. It is by thought only that we can form those conceptions of number and magnitude which are the postulates and the materials of mathematical science. By thinking, we both enlarge and rise above the limited and transient information which is gained by single acts of consciousness and sense-perception, as we lay hold of that in them which is universal and permanent. By thought, we know effects by their causes, and causes through their effects: we believe in powers, whose actings only we can directly discern, and infer powers in objects which we have never tested or observed: we explain what has happened by referring it to laws of necessity or reason, and we predict what will happen by

To what processes are the terms applied?

The relation of these processes to man's higher knowledge.

rightly interpreting what has occurred. By thinking, we rise to the unseen from that which is seen, to the laws of nature from the facts of nature, to the laws of spirit from the phenomena of spirit, and to God from the universe of matter and of spirit, whose powers reveal His energy, and whose ends and adaptations manifest His thoughts and character.

**The dignity of thought-pro-
cesses.** Thought, as already explained, not only gives us the most important part of our knowledge, but it qualifies us for our noblest functions. It makes us capable of language, by which we communicate what we know and feel for the good of others, or record it for another generation; of science, as distinguished from and elevated above the observation and remembrance of single and isolated facts; of forecast, as we learn wisdom by experience; of duty, as we exalt ourselves into judges and lawgivers over the inward desires and intentions; of law, as we discern its importance and bow to its authority; and of religion, as we believe in and worship the Unseen, whose existence and character we interpret by His works and learn from His Word.

**The thought-
processes illus-
trated by an ex-
ample.** § 373. But what it is to think, and how thinking should be defined, may be more easily understood by a concrete example. We take a familiar object, as an *apple*, and proceed to think it, in the various processes already named. We suppose that it is perceived and represented, and that we know from our previous studies what it is to perceive and remember. We begin to *think* this object, which has often been perceived and represented.

**The apple as
substance and
attribute.** First of all, we know it as a being or a something, as distinguished from nothing; and, as such, like every other entity, whether it be an actual or thought-being.

Next, we think or know this being as possessed of and distinguished by attributes or properties which we can separate in thought from the being to which they belong, but which are held to it, and to one another, by a natural bond which cannot be broken.

**Abstraction and
generalisation.** We go further: we observe in other objects—apples—attributes like those which we discern in this; we see the objects to be similar in color, form, taste, etc., and we think these apart from the less conspicuous attributes, and from the individual apples to which they belong, and then combine them into larger or smaller groups of attributes. In this way we form the mental product called a general *notion* or *concept* of the apple, or of apples in general as we say, which we can analyze and define. To *abstract* and to *analyze*, is to think.

**Classification
and naming.** Next, we restore, or think back, these general concepts to the individual apples, and in so doing, we divide them into *higher* or *lower*, *wider* or *narrower classes*; some by their color only, as red, striped, etc.; others by their form, as round, oval, etc; others by their taste, as sweet, acid, etc. To *classify*, is involved in thinking.

As we proceed, we mark and fix what we have done by language. We give names to each of these attributes, to the concepts and things formed and denoted by several attributes united; to the classes and sub-classes into which they are separated. Thinking is necessary to language.

**Geometrical and
numerical rela-
tions.** Next, the apple holds relation to space and time. It is both extended and enduring. The perception of the apple conditionates or involves the knowledge of both space and time; we do not here inquire how or why. By thought and imagination we are enabled to separate the object perceived

from both time and space, and to construct in space the various geometrical figures, as well as to conceive and define them by their necessary attributes or properties.

Moreover, all sorts of entities, whether things existing, or thought-things, whether attributes or beings, can, by the common relation to time of the mind that thinks them, be thought in the relations of number. They can be counted one by one; they can be gathered into groups, and the groups can be counted: the number of times a smaller group occurs to make a larger group, can also be counted. In this way all the operations of arithmetic or algebra are rendered possible as acts or operations of thought, upon concepts which thinking itself constructs and provides.

Again, the object—the apple—is believed to be produced from a tree, by beginning as the germ in the blossom, and gradually expanding into the ripened fruit. It is known also to be dependent upon the agencies of heat and moisture acting together with the living tree. The several changes which occur, together with their attendant conditions, are observed by the senses as they precede and follow one another. The memory gathers these in their order. Thought, however, connects them as *cause* and *effect*, and finds in the phenomena thus connected, the relation of the powers and laws of their causative agents. All these relations, and the conceptions which grow out of them, are known by thought.

We proceed to another act of thought-knowledge. By observing the powers and conditions in this class of apples, their habit of growth, the soil, situation and temperature favorable to their successful cultivation, we infer that the same are required in all cases, for this kind of fruit, and confirm the suggestion by experiment. This is knowledge by *induction*. Induction is a process of thought, for simple perception gives us no authority to believe with confidence that which we have not observed, nor does the simple memory of the past, or imagination of the possible, justify us in predicting events that are yet future.

But we do not confine our inductions to a single object, or class of objects. We extend them to still wider and higher classes, till, by thought, we have discovered the great powers which pervade the universe, and fixed the laws according to which they act. These widest inductions are known by the rational faculty which we call the power of thought.

But we do not rest with the induction of powers and laws. We observe that the apple is useful and pleasant as food. We notice that it is the product of cool climates, and can, with proper care, be preserved through the winter.

We do not merely observe and record these as facts, but we connect them by the relation of *adaptation*, or fitness to the wants of man. We discern other adaptations in objects. This adaptation implies design or thought in the structure of the universe. It shows us each inferior part as contributing to the superior, and all as acting together in perfect harmony toward the well-being of the whole. But adaptation and design are not seen nor heard; they are neither tasted nor handled, but they are known by a higher capacity of the intellect; they are the revelations of thought.

The nature and processes of thought might be illustrated by an example selected from the world of spirit. By consciousness, we know only individual states of perception or feeling. They follow after one another, like the successive waves of a rapid stream. Should we notice each individual as it passes before the eye of our consciousness, the eye would be confused and bewildered. But we detain or repeat one and another; we observe their likeness or unlikeness; we form concepts; we group them in classes which divide the individuals to which they belong; we fix and record the products of our acts by a name; we find common causes, powers, and laws for similar phenomena; we discern the adaptation of spiritual objects to one another and to the world of matter, and thus bind together the world of matter and spirit, in the unity and harmony of one comprehensive plan; the thinking of man interpreting in these ways the thoughts of God.

Thinking and
thought defined.

§ 374. From this review of particular instances of thought we derive the following definitions: To know by thinking, is to unite individual objects by means of generalization, classification, rational explanation, and orderly arrangement: Thought-knowledge is that knowledge which is gained by the formation and application of general conceptions.

Thinking is a species of knowledge; but knowledge has been defined as the apprehension of objects in their relations, the different species or modes of which are determined by the character of the objects and relations. Thinking, as defined from this point of view, is the apprehension of objects as generalized, and their implied relations.

We begin this knowledge with the formation of general conceptions as the first step in the process. We proceed to apply these conceptions in the various ways which these conceptions imply and render possible. In doing this, we are naturally and inevitably led to evolve the several products and kinds of knowledge which we have briefly sketched—*formation of the concept, classification, definition, division, deduction, induction, explanation, and systematic arrangement*. As the result, we gain *rational knowledge, philosophical knowledge, scientific knowledge or science, and practical insight or wisdom*.

The uses of the
terms justified.

§ 375. Some persons may question the propriety of designating these several processes by the term *thinking*, or *thought*, for the reason that these words sometimes signify to imagine, or believe on insufficient evidence. To apply these terms to the most important distinctions which we discern, and the most positive truths in which we confide, seems to intimate some doubt of the trustworthiness of the knowledge itself, and of the processes by which we attain it.

On the other hand, it should be remembered that thinking and thought, in the best English usage, denote, in a general sense, the higher as distinguished from the lower operations of the intellect. There are no single words so appropriate as these, which can be set apart to the technical service and designation of the operations of the rational faculty; no other terms are in actual use whose common signification is at once so comprehensive and so definite as are these.

Another profounder reason might be given. All the products, or object-matter, with which these powers are concerned, as they are general objects, in one sense exist only in and for the mind of man. The concept, the class, the argument, the inference, the reason, the system, are not individual entities existing permanently in the world of matter or spirit, but thought-entities, created by and existing for the intellect that thinks them into being. The operations which call them into being may properly be called *thought* and *thinking*, in distinction from perception, which has to do with those individual objects or events which exist or occur in the universe of fact.

What these
terms do not
imply.

The use of these terms does not, however, imply that the objects are less real, or that the knowledge is less certain, than the acts and objects of sense and consciousness. On the other hand, many of these objects are more real, and much of this knowledge is more certain. By these acts we know things in their essential nature, their fixed causes, their unchangeable laws, and their controlling ends; in other words, we know them by a deeper insight, and in higher relations, than we can by the observations of sense or the experience of consciousness. By thought, we correct the mistakes of single observations; we gain power over nature and over ourselves. By thought,

we see into the truth and essence of things, we read the secrets of nature, and interpret the very thoughts of God.

If, by an occasional use, the word to *think* signifies to surmise, to imagine, or to believe without reason, this does not exclude or destroy its higher meaning.

Appellations for
the power of
thinking.

§ 376. If it be difficult to find an appropriate term to stand for all these higher processes, it is almost as difficult to find or select an appellation for the power which qualifies us to perform them. The *intelligence* and the *intellect* have been thus appropriated, but they are also used for the capacity of the soul for every species of knowledge, the lower as well as the higher; for the power to know by sense and imagination, as well as the power to know by general conceptions. The *understanding* is sometimes employed in this very general sense, and sometimes limited to a single and special function, as by Coleridge and others, after Kant. The *judgment* is used, likewise, in a wider and a narrower sense. The *reason* seems better fitted than almost any other term, and yet the reason is used for the very highest of the rational functions, or else in a very indefinite sense for all that distinguishes man from the brutes. It remains for us to choose between the *rational faculty* and the power of thought, or briefly, *thought*. For brevity and precision we prefer *thought*. It is scarcely necessary to observe that, like perception and representation, and many subordinate terms, thought is used at one time for the power, at another for the act of thinking, and at another for its product. Thus we say indifferently, 'Man is endowed with *thought* as well as with sense:' "Sits fixed in *thought* the mighty Stagyritye:" "A penny for your *thoughts*!"

Terminology
and influence of
Locke's Essay.

If the reason were asked why no single term has been assigned by English philosophers to this higher power in man, we must answer, that it is in part owing to the want of definite and accordant views in respect to the nature and functions of such a faculty, and in part to the influence of Locke's *Essay*. This work is quite as much a treatise on logic and metaphysics as on psychology. It scarcely professes to give a complete and systematic view of the powers of the soul, but is chiefly occupied with an analysis of ideas; the manner in which they are formed and the sources from which they are derived. Even in the incidental notice which he takes of the higher powers, Locke is especially superficial and hasty.

These powers, in addition to those of sense, reflection, and memory, are loosely called discerning, comparing, compounding, naming, abstraction (B. II. c. xi.). He promises to treat of these fully afterwards, but fails to redeem his promise psychologically; what he contributes in addition being only in the way of logical and metaphysical analysis. Locke gave the direction to all subsequent writers, even to those who differ from him most materially. Even Reid, in treating of the higher powers, groups them all under judgment, which he treats quite as much from a logical as from a psychological starting-point. The threefold division, derived from the Schoolmen, of knowledge into simple apprehension, judgment, and reasoning, seems to have exercised a powerful influence, often for evil, over the psychological treatment of the higher powers. This is to be observed even in Kant.

It is worthy of notice that, before the time of Locke, the intellectual powers were, in England, divided into three: sense, phantasy, and intellect. The oldest antagonists of Locke, as Lee, Bishop Peter Brown, and others, complained that he did not recognise this division.

Whatever else of good may be said of Locke, in that he emphasised consciousness (reflection) as a distinct source of knowledge, of equal authority with sense; he did no good to psychology by abandoning this received threefold distinction. For all his efforts to give clearness and precision to his conceptions and nomenclature, Locke merits the highest praise. He is to be honored for his unwillingness to acquiesce in traditional terms or forms of speech, and for his desire to find a meaning in all that he accepted; but he is not to be commended for rejecting the traditional psychology of the schools because of its formalism, and yet following blindly the traditional logic, which, if possible, was even more formalistic and empty.

Two aspects of thought.

§ 377. The power of thought may be considered in two aspects: as a capacity for certain processes or functions; and for originating or bringing to view certain fundamental conceptions or relations. In the one of these aspects it performs the several acts which we have enumerated, of generalizing, judging, reasoning, etc., the most of which are usually called logical processes, because they are more or less intimately related to deduction or reasoning. In the other, it is viewed as the discoverer of certain native conceptions or intuitions, and the propounder of certain first truths, or first principles; which are also called necessary and universal propositions, or axioms of reason. These conceptions and propositions are called metaphysical conceptions and metaphysical truths.

To the performance of the processes which have been named, these conceptions are absolutely essential. We can neither generalize, nor reason, nor infer, without both assuming and employing the conceptions of substance and attribute, cause and effect, means and end. But the power which originates and reveals them is distinguished from the faculty which applies them, or rather, we should say, the same faculty has been differently named according as it is viewed as developing or as applying these necessary conceptions and relations.

Often distinguished as two faculties.

Hamilton treats these two offices as two faculties, the elaborative and the regulative, the one of which elaborates or works over the materials furnished by the lower powers, according to the conceptions or rules which the other furnishes or prescribes. In this he follows Kant very closely, who calls the logical faculty, the *understanding*, and the power to which it is subjected as explained by his peculiar philosophy, the *reason*.

It is more legitimate to consider the two in conformity with the analogy which we discern in the other powers of the soul; the one as the capacity for certain definite acts or processes of knowing, which we consciously exercise and employ; and the other as the unconscious source of those conceptions, according to which the material of knowledge must arrange itself by the very constitution of the thinking power. According to this view, the logical or elaborative faculty, or the understanding, performs its appropriate functions, which are analogous to those of conscious presentation and representation; while the reason, or the regulative faculty, or intuition, is like the unknown and unconscious power possessed by the soul to prepare for the senses and memory their appropriate material (§ 47).

Forms and laws of thought. Forms of being.

§ 378. The thinking power, viewed as the capacity for certain processes, thinks in various methods that are clearly distinguishable from one another, both as acts and products; while, as in the other activities of the mind, we measure the process by the product, the two being often denoted by the same word. These several products are called *the forms of thought*, or thought-formations. Into these forms or formations these several processes bring every individual object, and express them by appropriate words. These forms are the *concept*, the *judgment*, the *argument* or *syllogism*, the *induction*, and the *system*.

Each of these forms has its constituent elements and relations, which, in their turn, are evolved by the action of the thinking power.

As the discerner or the discoverer by intuition of certain necessary conceptions or relations, the thinking power is said to know or assume certain *forms of being*, according to which it performs its operations of thinking, and constructs its *forms of thought*. These are called indifferently, *forms of being* and *forms of knowledge*, for the reason that the mind can only know what is or exists, and according to the relations in which it exists. Some of these forms of being or forms of knowledge are *time* and *space*, *substance* and *attribute*, *cause* and *effect*, *means* and *end*.

The laws of thought are criteria of correct thinking, and are stated in the form of rules, for the purpose of preventing those errors to which the intellect is liable in its actual thinking, and of readily detecting and correcting such errors when they actually occur.

The forms of thought, in a sense, are *laws of thought*, inasmuch as the mind cannot *think at all* except it thinks in or through these forms. The laws of thought, however, as technically conceived and defined, are those logical and practical rules according to which we must think, if we would think correctly. The forms of thought make it possible for us to think at all. The laws of thought direct us how to think logically and correctly.

Inasmuch, as we shall see, the object-matter of our thinking is far wider than the object-matter of our knowledge of facts or things, these forms of thought are also applied to abstract and hypothetical thinking, as well as to concrete and actual knowledge.

§ 379. The power of thought, as a capacity for certain psychological processes, is dependent for its exercise and development on the lower powers of the intellect. These powers furnish the materials for it to work with and upon. We must first apprehend individual objects by means of sense and consciousness, before we can *think* these objects. We can classify, explain, and methodize only individual things, and these must first be known by sense and consciousness before they can be united and combined into generals.

Not only is it true that these lower powers are necessary to furnish the objects for thought to work upon, but it is true in fact that they are developed long before these higher powers. The infant must go through a training of the eye and the ear for months, before it begins to name and classify with effect. It is the conscious subject of a multitude of mental states, before it gathers the most obvious under a general conception. The discipline of attention must be for a long time enforced, before the developed mind can learn to apply the commonest concepts or to affix the simplest names. The conceptions of cause and effect, and of means and end, are not developed till the intellect has become still more mature.

To the development of thought, the representative faculty is also largely subservient. The individual object must not only be apprehended in order to be thought of, but it must be recalled again and again. To thought, the discernment of similarity is required; and in order to this, the past must be frequently confronted with the present, and the present

Relation of
thought to the
lower powers.

must be compared with the past. Objects striking for their likeness or their difference, must be recalled by the memory and revived to the imagination, in order that like objects and like phenomena may be grouped and arranged in the rudest classification. If the classification is to be perfected to any thing like scientific exactness, the memory and imagination are to be tasked still further in order that one's *thoughts*—i. e., one's *concepts*—may be just to the reality of things.

But while the thought-power, in its various operations, is thus shown to be developed later than the several forms of direct cognition, it should not be supposed that it springs into perfect and mature energy by a single bound, or that the infant acts of perception are not affected by its rudimental activity. The human intellect is a unit, and the action of one power is tinged or modified by the feeble energy of all the others. The sense-perceptions of the infant may seem to be more feeble and less mature than are those of the young of the brute. The higher powers may meanwhile seem to lie torpid long before they are called into distinct activity. But before they are revealed to the conscious subject of them, or are expressed in the simplest forms of language, they give direction and character to the perceptions of sense. They impart to the human eye a cast of dawning intelligence which distinguishes it from the keener eye of the dog or the eagle. It is in entire accordance with the analogy of the general development of the soul, that the mind should make efforts to think, before these efforts are distinctly apparent to the subject himself, or to the observation of others.

Those efforts of thought with which the philosopher is concerned, are, however, those which cannot be questioned, and which are positively revealed in language.

Concrete and abstract thinking.

§ 380. Thinking, again, may be distinguished as *concrete* and *abstract*. In concrete thinking, we know of thought-conceptions and relations only in their application to individual or concrete things or individual objects. More exactly, we know individual objects under or by means of the relations which thought furnishes. In abstract thinking we separate these conceptions and relations from any and all individual objects. We consider them apart by abstraction, and sometimes treat them as though these conceptions and relations could have an independent existence. In concrete thinking, we proceed as we have described in § 373. We perceive an apple or a stone. By thought, we know it as a being. We think it as round, or oval, as colored, etc., etc.; we apply to it the proper adjectives, or qualifying words. We do not think of the distinction between the apple as a substance, and its attributes; much less do we think of *being* in the abstract, and speculate about the distinction between substance and attributes, as to its origin and nature. We simply know this individual object as a being distinguished or qualified by attributive concepts and names.

In abstract thinking, we separate or abstract from every individual object the generalized conceptions which we produce by thinking, as also those by means of which we think; as the concept, the judgment, the argument, the inference, on the one hand, and substance, i. e., being and attribute, cause and effect, means and end, on the other. We even abstract

and generalize our very acts or processes of thinking, and view them apart from the individual examples or cases in which they actually occur. We ask, What is it to conceive, to generalize, to judge, to reason, to infer—nay, what is it itself to think? We discuss the nature and origin of these conceptions, and their relations to one another, and to the objects to which they are applied, and to the rest of our knowledge.

Concrete thinking is performed by every human being whose powers are fully developed. All men freely apply its original conceptions and relations. By means of them they know sensible and spiritual objects, so far as they know them at all. A stone or an apple, a horse or a dog, a house or a church, a spirit or a person, each and all are known as beings, and are distinguished and defined by certain attributes or properties. One of these acts upon another, as cause producing an effect. One alters the form of another, scatters its particles, unites them in a new form, or produces a new existence. The fire causes the gunpowder to explode; the magnet attracts the iron; the spirit moves the body, and, by means of its own body moves other bodies also, and expresses itself by motions, looks, and words.

In myriad forms, objects are familiarly known by us as substances and attributes, as causes and effects, as means and ends. In the concrete form, all these conceptions are present in the language, and familiar to the minds of the most uninstructed men. They animate and direct all their actions in common life. They are the grounds of their opinions and beliefs. They excite their hopes, arouse their fears, and move all the springs of feeling.

But when these conceptions are abstracted, and viewed apart from individual beings, they are not easily made familiar to the mind without a special discipline. It is only a few men who possess the tastes or the training which qualify them familiarly to deal with or rightly to understand thought-conceptions when abstracted from concrete things. Skill in using, and discrimination in understanding them, can only be acquired by patient and concentrated efforts.

Each of these classes of men are exposed to a special danger. Those who are accustomed to these conceptions only in the concrete, and who have no familiarity with them when presented in the abstract, do not readily assent to their reality, when thus taken out of their applications and made the objects of philosophical analysis. They stare at these abstractions as at pallid ghosts, that walk abroad only at midnight, and are scared by the broad and bright light of the open day. They even question their validity, and the authority of the processes by which they are formed. Though they prove themselves to be their every-day acquaintances, they can scarcely compel recognition on account of their strange clothing. If recognition is at last compelled and conceded, men untrained to abstraction are never quite easy in their presence, or ready to trust them in their uncommon and unfamiliar garb.

Those trained to philosophical thinking often rush into the opposite error. They treat these abstract conceptions as independent entities. They believe that these ghostly creations have veritable flesh and blood. Because they are denoted by nouns and receive separate appellations, they are considered and treated as things. Those who analyze and discuss them, often forget that the only existing beings are material things and spiritual agents, and that it is only as attached to these that these abstract conceptions and relations can have actual force; as it is by these only that their true nature can be understood. These existing beings alone both exist and are known, and stand in certain relations to one another, and to the being which knows them. They cannot be known in the concrete, or as individuals, except as individual beings with individual attributes, as individual causes capable of individual effects, as individually adapted to individual ends. To these individual truths or facts concerning individual beings, must all the

abstractions of thought be brought back. They must all be translated into these, in order to have any meaning or any truth.

Relation of knowledge by experience and by thought. § 381. There is no natural antagonism between knowledge by experience and knowledge by thought, or, as it is sometimes called, the knowledge of individual facts and the knowledge of truths. Those who insist that what we observe by the senses or experience in consciousness is the only knowledge on which we can rely, overlook the fact that nothing can be known by observation or experience which is not also known in some of its attributes, effects, or uses, and that it cannot be expressed in human language without being generalized, expressed in propositions, and used in deduction and induction. They do not notice that no human being can observe facts without *thinking* those facts.

On the other hand, thinking, without deriving our thoughts from and testing them by individual examples, is no thinking at all, because it violates the very definition and conception of thinking which makes it begin in the actual with individual perceptions and experiences, and proceed by generalizing what it observes. Facts unconnected by those relations of thought by which they are conceived, classified, explained, and described, are barren of all interest and unproductive of all use. Thoughts, as mere abstractions, are the vaguest and driest of all phantasms, except as they are exemplified by facts. Facts without thought-relations are poor and barren. Thoughts without facts are empty and useless.

Relation of thought to language. § 382. Thinking is aided by language, and, to a great extent, is dependent upon it as its most efficient instrument and auxiliary. But thinking is not constituted by, but, on the contrary, itself originates and gives form and law to language.

The connection between thought and language is so intimate, that we shall have occasion to refer to it again and again. One or two general remarks in respect to it, seem here to be in place. The reason why thought requires such an instrument and assistant as language, is, that the objects of thinking are generalized objects, and to such objects there are and there can be no realities actually existing. The results or products of our thinking are not manifested by any changes which are actually effected in material or spiritual objects. When we observe a countless number of similar animals and group them into a class, we do not impress by these acts any changes upon their structure or their habits. We may classify and arrange them into a complete and well-ordered system, but we do not add to, or take from them as individuals a single property. The same is true of spiritual beings and acts. Nothing passes over to the objects thought, which shows how we have thought and classed them. In the knowledge by sense, the same object reminds us that we have seen it before, or an object once seen is itself suggested to our memory and recognized as previously known. So, in spiritual acts, one individual is recognized as so like another that we call it the same. But thought-generalizations have no such objects by which they can be recalled and tested. It is only

by language—the sound to the ear, and its symbol for the eye—that the *products* of our activity can be fixed so as to be the *objects* of recall and future use. Hence words spring into being as fast as definite conceptions are formed. Hence it is as natural for man to speak as it is to think, and man ‘speaks because he thinks.’ The name petrifies, preserves, and exhibits the fitting concept as in a crystal shrine, both hard and clear. The proposition embodies the judgment for the use of the man who first thinks it, and who expresses it to stimulate the thinking of others. In applying names, we must enter somewhat into the nature and properties of the objects for which they stand. In defining terms, we must be guided to their meaning by observing the things to which they are applied. In accepting or rejecting propositions, we must think of the relations of the objects which they concern.

A limited language indicates limited thought. It follows that, as an individual who is limited in his thinking will require and use only a limited vocabulary, so it will be with a community. Wherever we find a language scanty in the number and meagre in the import of its words, or a language which is limited in the combinations and relations of its syntax, we always infer that the thinking of the people who formed or used this language was imperfectly developed.

The study of words is a study of thought. It follows, also, that the study of words must be a study and discipline of thought. To master a language that is rich in its vocabulary, requires that we contemplate the nicer shades of thought which are expressed by the endless variety of the conceptions which are embodied in its words. If it is complicated in its structure, we must discriminate all the delicate relations which this syntax expresses or suggests, and trace them through all the variety of forms in which they are expressed. No language can be *dead* to the intelligent student. Its thoughts are enshrined, not buried; for they can be made living at the call of the mind which thinks them over again, long after the minds which first conceived them have passed from the earth. According as these thoughts were crudely conceived or delicately distinguished, so is the language itself rough or polished, awkward in its structure, or plastic as the living spirits which moulded it. The delicate tissue of words reflects the varying shades of thought, feeling, and opinion that run through every part of the fabric, like threads of silk and gold.

But, on the other hand, words in no sense constitute thought, as some hastily infer. Language is simply thought expressed, though the thought is made permanent by being expressed. It is formed by the thinking power, because this requires for its development and perfection a sensible expression of its inner processes, and seeks a permanent embodiment and record of their results.

CHAPTER II.

THOUGHT—THE FORMATION OF THE CONCEPT OR NOTION.

THINKING has been already defined as that series of processes by which we form and apply general notions or concepts. It is obvious that the first act in this series of processes is, to form or develop these products. The consideration of the process will instruct us as to the nature of the product. The psychological knowledge of the acts by which we attain the concept, will instruct us as to its nature and definition, and prepare us to understand the other thought-processes to which it is preparatory, as well as to evolve those metaphysical beliefs and original notions which it presupposes. All will agree that the greater part of our general notions are formed or acquired by the exercise of the soul's own energy. However earnestly or positively some may insist that a part of our notions are innate, none will deny that the great variety of notions which we apply to common objects are acquired by special mental acts.

Material objects
perceived before
concepts are
formed.

§ 383. We begin with the *concepts of material objects*, such as a stone, an apple, a horse; and observe that such objects must be perceived, in part at least, before we form general notions of them. We do not insist that the process of perception should be complete before the act of generalizing begins. It is not necessary that all the percepts appropriate to the several senses should be gained, and that these should be united under all their relations, before generalization commences. Still less is it intended that all the acquired perceptions should be mastered; for generalization may assist sense perception in these higher combinations and acts. It is necessary, however, that a percept should go before a concept in the order of time, as it is the foundation for it in the relation of logical subordination. A general notion requires individual objects to which it can be applied; and individual objects in the material world can only be known by perception.

Perceived objects
are known to be
similar.

The mind begins to generalize as soon as it knows that several perceived objects are different as individuals, and yet are in any one respect alike. Before generalization, they may be known confusedly or known vaguely. The perceptions from the many objects may be taken to be one through careless inattention, or may be known as many, and yet be neither clearly distinguished as apart, nor clearly united as similar. As soon, however, as they are distinguished, as not the same, and yet as united by a common likeness, the process of generalization has begun. This process is possible even with single percepts. If ten patches of red color, of the same form, dimensions, and intensity, were presented to the eye, the mind might gather, or conceive, or grasp them together, by their common redness, and form a general notion of them; separating them as many by their distinguished or *distinct* position in space, and yet uniting them as one by the single similarity of color.

If these ten red discs of color, by the use of the remaining senses, are

afterwards known to be ten red apples, *i. e.* if other points of likeness are perceived, the generalization is more complex in its materials, but the process is the same. What is the process? What are the elements or separable acts which it involves?

This involves analysis of their relations.

The process involves an act of analysis or attentive discrimination. The mind must notice that which is common, and distinguish it from that which is diverse. That which is diverse must have been noticed when the individuals were perceived. In generalization, the mind goes one step further: it discerns, by a separate act, that which is common. This act is an act of comparison. Its appropriate object is likeness or diversity. It discerns it first as similar, *i. e.* the red, or whatever it may be. It takes this similar to be the same, and, so regarding it, finds it in every one of the individual objects. This similar something, conceived as common to many objects distinguished as individuals, is a general conception, notion or *concept*.

Beings distinguished from their attributes.

The individuals are, in common language, called beings; that similar something which is common to all, is their attribute. The individuals are called beings, because, as we have previously explained, every object of direct knowledge is a being. Every object directly known as diverse in space or time, is a separate or different being. But, by comparison, we know these beings in a new relation, as being similar in one particular. This similar something is not a being, for it is discerned in all, and known of all, of one as well as of another. This is called their attribute, because it is asserted of each, or attributed to each. It is also called property, quality, predicable, etc., etc., for reasons which are purely logical, and which will be explained in their place.

Abstraction; to abstract and to prescind.

§ 384. The mental acts which we have described, are familiarly known as follows: The act of analytic attention by which that element in each of these objects which is like its fellow in every other, is separately observed or noticed, is usually called *abstraction*, because the mind draws it away from the other parts or percepts. Kant and Hamilton say that abstraction refers to that *from which* the mind withdraws itself, while it *prescinds* the similar to which it attends. Thus, in the example cited, the mind prescinds the redness, and abstracts its attention from all the remaining attributes.

Comparison.

The next step is, to perceive by comparison that the several objects to which we thus separately attend, are alike. This is to compare, or to know by comparison.

Generalization.

The next step is, to consider these several *similars* as the same, as one something which is common to all the individuals perceived. This is to *generalize*—to make general—more properly, mentally to think or affirm a common something of all these individuals. The similar *red*, or *round*, or *sweet*, or *bitter*, is made one, and, as one, is regarded as common to each of the different individuals. Which of these acts is first performed, is immaterial—whether the mind seems to generalize before it abstracts, or the reverse; or

whether it attends, compares, and generalizes all in one. It is all the same as to both process and product, whether we separate the redness from the first apple which we perceive, before we apply it to the many, or are stimulated by observing many red apples to notice and abstract that which is alike and common, or whether the points of difference excite us to generalize the one, or more, in which the objects are alike.

The attribute
affirmable of
many beings.

Again, when this common something has thus been generalized by like objects, it can be applied to any and every other object to which it is appropriate. Thus, *round*, after being thought of a single class, as of apples or balls, may be thought of all objects that are *round*—as of the vast spheres which are hung in the heavens, or of globules so minute as to be indiscernible by the naked eye.

These processes
performed by all
men.

These processes are performed by all men whose higher powers are at all developed. Every such man knows what they are, for they all abstract, compare, and generalize with equal ease, though not to the same extent or with equal perfection. All men do not discern with equal readiness that which is alike and that which is different in individual objects. There are shades of color, peculiarities of form, varieties of taste and sound, which some men can never distinguish as either alike or unlike, with the utmost energy of attention. Many more are not reached, through indolence, or carelessness of attention. There are others still, to discern which we need a special discipline: as the training of the painter's eye, the musician's ear, or the mechanic's touch. There are abstractions, however, which all men make who think at all, even the rudest and the youngest. There are generalizations also, to which all are competent, and which all men habitually perform.

Presuppose the
distinction of
substance and
attribute.

§ 385. It has been already observed, that these processes develop and presuppose the distinction of substance and attribute—i. e., of being and distinguishing relations. The individual apples of which we think the redness are beings, the redness is their common attribute. What is the nature of, and what the authority by which we make this distinction, we do not propose here to inquire. For our present purposes, it is sufficient that we call attention to the fact that it is fundamental to the process of forming the notion, and that it must be assumed as real, and be firmly believed by the mind.

This distinction
not discerned by
sense-perception.

One thing only we observe: The distinction is not discerned by the mind through the organs of sense. We abstract one sensible quality after another, and we still say the being remains. When every sensible quality, save one, is conceived to be removed, we even then distinguish what remains as substance and attribute. We cannot take away one quality after another, as we lay off the folds of a crystal or the layers of an onion, and find a material *nucleus*, or *core*, which is itself a simple being, without attributes or qualities; for what remains is as truly a being and an attribute as that with which we began. So far as the senses are concerned, what we call the qualities and being are blended in one and constitute a whole, and yet we believe that the two are diverse from one another, and that every mind assumes the distinction to be valid and real. It is only when we analyze the thinking process and its product by a reflex and generalizing act, that we find that we cannot affirm the similars conceived as the same, to be common to

every individual, without framing a thought or mental something which is distinguishable from the beings to which it belongs.

We rest here, at present, with this discovery, which points to further inquiries—viz., that the distinctive or differing conceptions of being and attribute are not discerned by sense-perception, but are evolved in the processes of thought.

By the same method, we prove that they are not discerned by our consciousness. Nor strictly speaking, by consciousness. experience of single *spiritual acts* or *states*. Though it be essential to each one of such acts or states, that they be performed or suffered by the identical *ego*, yet these acts or states must first be abstracted, compared, and generalized, before they are known as attributes, and the *ego* is known as a being, or the subject or substance of common attributes. Of spiritual as really as of material attributes and beings, it is true that their concepts or notions are evolved and discerned by thought.

The further discussion of the import and origin of these correlates must be reserved for another place. [Cf. P. IV. C. VII.]

The product, a concept, or notion. Import of these terms.

§ 386. The product of the processes which have been considered, is called a *concept* or *notion*. We employ these terms because they may be made precise in their import and technical in their use. Conception is sometimes used; but conception is, in our English philosophy, used indiscriminately for any and every object of the mind's cognition, or else is arbitrarily limited, as by Dugald Stewart, to the individual object of representation; thus made equivalent to image. *Abstract general conception* (or even *general conception*), is sufficiently precise in its import, but is too cumbersome for common use. *Concept* and *notion* have each, in their etymology, a special signification appropriate to one aspect or feature of the product to which both are applied. *Concept* signifies that which is grasped or held together, and refers us to the act by which different similar attributes are treated as one, or the same act by which separate individual beings are united as one by their common attribute or attributes. *Notion*, on the other hand, indicates that which is or may be known by certain signs or marks, *notæ*—i. e., constituting, defining, and distinguishing attributes. *Concept* refers us to the psychological process by which the product is formed; *notion*, to the uses to which it is applied. Both may be properly employed as technical and scientific designations.

The reality of the product questioned.

The reality of any such mental product or thought-object has been questioned chiefly by those who have misunderstood or misconceived its nature. Its import or nature has been imperfectly or vaguely estimated even by many who have believed in its reality. It is only by explaining its nature, both negatively and positively, that its reality can be vindicated and established.

Concept no. a percept.

The *concept* is not a *percept*, nor is its object an object as perceived. This last is strictly individual; the concept is uniformly general. The one differs from the other in the conditions which occasion it, the process from which it comes, and the result which is evolved. In order to prove this beyond question, we have

only to ask what the mind knows when it sees a man, and what it thinks of when it utters the word *man*, and applies it in thought to the human species. No one can doubt that the two objects of cognition are diverse, even though he may not easily explain in what this difference consists.

Not a mental image.

The *concept* is not a mental *image*, or the object of the mind's cognition in representation. We recall an individual percept, one or many; or we form, by creation, some image unlike any which we have in fact perceived. These objects are, as truly as percepts, clearly distinguishable from that which the mind thinks or knows when it uses a general term. It is not asserted that the mind is not aided by percepts and images, in forming, recalling, and applying its notions, but only that they are not the same, and should not be confounded.

No existing individual corresponds to the concept.

Again, it is not asserted that there is any individual being, or any being existing in fact or nature, which answers precisely to any concept or notion. There is no such thing existing as a *man* or *tree* in general, but only individual men and trees. The notion exists only in the mind which forms it, and in the mind which receives it from another, forming it over again for itself in the act of receiving and using it. If it be asked, How, then, is it that these notions are denoted by fixed terms that are universal in all generations and have their synonyms in all languages? We reply: The human mind generalizes by similar processes, and is furnished with similar objects, having the same essential and common relations. Hence, each man forms the same notions with every other, so far as each uses the same powers upon the same objects with similar fidelity and attention.

Is a relative object of knowledge.

§ 387. We observe positively: the concept is a purely relative object of knowledge. This is its distinctive feature, that it has definite relations to objects of sense and consciousness. So far from forming an objection to the possibility, the reality, or the significance of such an object of thought, that it is not like an object of sense or experience; this very circumstance proves its possibility and provides for its credibility. As a mental product and mental object, it is purely relative, being formed by the mind and understood by the mind as indifferently common to single objects; as, so to speak, held ever ready by the mind to be affirmed of, and restored to, the single objects to which it relates. These objects only enable the mind to understand its import. The individual things to which it relates, give to it its significance and utility. Without these, it is a *no-thing*, an unintelligible and unreal fancy. This peculiarity of the concept is implied in its various appellations. It is called a *general*, that is, capable of being thought of many individuals, which are thereby grouped into or conceived as a class. It is called also a *predicable*, by its very nature capable of being affirmed or thought of single objects. It is a *universal*—i. e., pertaining equally to all the individuals to which it belongs.

In what sense is the concept a symbol?

The relative character of the concept is still further expressed by the assertion, that the knowledge which it gives is *symbolical* only. Under this view, concepts are viewed as being like to mathematical characters or symbols.

They have no import and impart no knowledge when used apart from the objects to which they relate, but serve an important purpose in enabling us to recall our previous observations of comparison and analysis. They also fix such observations, so that we can avail ourselves of them at a subsequent time. They assist others in making the same observations more surely and readily. But aside from their application, they are as meaningless and dry as are the characters and signs of a mathematical formula (cf. § 427).

The concept more than a name.

Others have contended, that the only symbol required is the word; that names, or general terms, are the only characters required for the purposes above described; that the concept or notion, when regarded as intervening between the name and the individual object, is a mere fiction. This view,

so earnestly urged by the nominalists of ancient and modern times, and by some eminent philologists, is exposed to the following objections: First, there could be no generalization or thought-knowledge without language. This consequence is set aside by the notorious fact that deaf-mutes can generalize without the use of written or spoken terms, and even without any language whatever. The sign-language which they use when without culture, is but the painting of individual objects or acts. Second, general terms, when used as symbols, do not symbolize sensible or individual objects as such, but only elements, attributes, or parts which are separated by analysis, and compared as like or unlike. If these mental operations did not separate and fix these objects, the words would have no meaning; they would have nothing to symbolize, they would stand for nothing, they would signify nothing. Let it be granted that what they do signify cannot be known except in its relation to individual beings, and by means of these beings or those which are like them, it does not follow that when these objects are before the mind it does not find that in relation to them, which is conceived by itself, and then signified by language.

That in the individual objects which the mind can distinguish by analysis, and then recombine by synthesis, is not now the subject of our inquiries. We assume that these individual objects are capable of being thus analyzed into relations, properties, and attributes, and that these relations, etc., can be discerned to be like, and thus united under a common concept, which concept is by its very nature applicable to every one of these objects.

The concept respects attributes or relations.

§ 388. Again: as being this common and relative thing, the concept *respects only the similar attributes* of individuals, or such as might be supposed to be alike. It respects those

elements which analysis can separate as individually distinct and comparison can unite as alike. Attributes, properties, and relations, are the only objects which it respects. These are first discerned, then compared, then united into a single thought-object. This object is the concept or notion.

Can brutes form concepts?

Herein lies the difference between the act of a brute and the act of a man in perceiving objects that are alike. In one sense, the brute may perceive what is similar as readily as a man; in some cases, even more quickly, for his senses may be more keen. If he has been ill-treated or frightened by any

other animal or any other thing, whatever is like it will be avoided at once. But the brute does not attend and analyze as does a man. Hence he cannot discriminate so as to abstract; or, at best, the degree and range of such efforts must be very limited. His power to compare and discern the like and the unlike, would for this reason, be lame and feeble if no other were suggested. Should it be granted that the brute can discern similar attributes, it has no power at all to conceive or think the *similar* as the *same*. It cannot form and use a

concept as founded on attributes and as common to individual beings. Hence, the brute is incapable of language. He may utter sounds and cries, which instinct extorts and to which the instinct of the hearer responds, and thus the voice and ear of the animal tribes may serve some of the useful and social ends which language accomplishes in man; but the brute is incapable of language as the signs of concepts, because he is incapable of thought. He cannot form and use a concept, and therefore he can neither speak nor understand a single word. Even the parrot, that miracle of talkers, is incapable of language, and never utters what deserves to be called a word.

The concept respects relations only.

We observe still further, that all which the concept contemplates or signifies, is these common attributes which are discerned in the individuals to which it is applied. These attributes are its proper and sole import or signification. The concept, as such, is not at all concerned with the number of individuals in which these attributes are found, or with anything else which may be true of them. It is all the same to our thinking and to the concept which we form by thinking, whether the tree of which we make and use the notion, is here or there; is high or low; is the tree which we have often seen and admired, or the tree which is ten thousand miles distant; is the tallest of the cedars of Lebanon, or of the firs of California, or the most dwarfed and stunted on the coldest mountain summit. It is even indifferent whether it actually exists or not; it is only essential that it be made up by the mind of the actual constituents of every object that is properly called a tree.

So of the notion of *man*. It is of no importance whether we apply it to this or that man, to a tall or short, a black or a white man, to the man whom we love or the man whom we hate, or whether we apply it to any man at all, so long as we make it to stand for the attributes that properly belong to every one who is indeed a man. So far as the signification is concerned, the noun *man*, the adjective *human*, and the abstractum *humanity*, are precisely the same. The three denote only a single concept, viz., that composed of the attributes which belong to men. But why, then, are three words employed, if their import is the same? Why are general terms divided into nouns, adjectives, and abstracta? We answer: The difference of these words concerns their application, and the convenience of language for brief and condensed expression. It does not in the least regard the import of the concept common to the three terms.

Concepts as concrete and abstract

§ 389. It is important to notice, however, that in their application, concepts are distinguished as *concrete* and *abstract*. The concrete notion contemplates attributes, and is applied to beings existing. The abstract notion treats an attribute as though it were itself such a being. Of the three notions named, *man* and *human* are concrete; *humanity* is an *abstract* notion. The concrete notions are applied directly to an actually existing being, for purposes of classification and language, which need not here be explained. The abstract *humanity* is applied to designate a being that is purely fictitious, so far as actual existence is concerned, but which, in language and in thought, is treated as though it were a real being.

It is conceived as a being, by having attributes affirmed of it; as when we say, *humanity is frail and perishable*. It has adjectives prefixed to it, as in the phrase, *our original humanity*. It is divided into classes: humanity is either *instructed* or *neglected*, etc. In short, it is capable of being treated in every way, as though there were living beings called humanities. But when we analyze the real meaning of language, and the thoughts of those who use it, we find that the only beings distinguished by the mind are the living men who are endowed with human attributes. Every one of the phrases or sentences in which we use humanity as a being, could be exchanged for others in which men only should be spoken of. These sentences might be long and complicated and awkward, but they would serve to show that *abstracta*, or abstract nouns, have no actual existence themselves, but in every case carry us back to some real beings in the world of matter or spirit.

There is still another sense of the words *concrete* and *abstract*, which is purely logical, excluding all reference to existing things, and concerned only with notions as compared with one another. According to this use, the concrete notion is the notion with a comparatively full significance, consisting of many, packed full of, attributes, while the abstract is one with few.

§ 390. Notions, again, are still further distinguished as *simple* and *complex*. This concerns their import, and not their application. Those notions which are made from a single attribute, are *simple*. Those which are made of more than one, are *complex*. Simple notions are called, by Locke, *simple ideas*. They cannot be analyzed or decomposed into any constituent elements. The mind directly discerns them by its various powers of knowledge. Such words as *white*, *whiteness*, *green*, *greenness*, etc., etc., are usually given as the names of simple notions. It would be more exact to say that we treat these notions as simple, because we do not ordinarily distinguish in thought, or by language, the discernible shades of white or green. Those which are properly simple, would be such shades of color as can be distinguished from every other. On the other hand, *chalk*, *chalky*, are complex notions, because they signify more than one attribute. So, *man* and *human* are complex spiritual notions, for they contain many attributes.

No thing or being actually existing is represented by a simple notion. A grain of sand or mote in the sunbeam, is complex, for it has form, dimensions, color, weight, etc., etc. Nature gives us no simple ideas. She touches us through too many avenues of knowledge. She leads us to observe varied attributes in every existing thing. We, in our thinking, analyze and separate her complex objects, and reconstruct and recombine the elements which, at her prompting, we have abstracted and generalized. In this way we separate and reconstruct the elements or attributes of material objects as nature exhibits them to us, as of plants, and animals. Thus, all the concepts which are expressed by the general terms that form the staple of every language, are constructed by the mind. They are passed from one mind to another. They are fixed in words and recorded in books and literature. The names of the objects that human art and skill has constructed for use or beauty, likewise stand for the complex of simple notions which we observe in these objects. The artificial creations, such as are conceived by human invention and spring from human society, the crimes which are defined by human law, the offices and relations of government, the signs and proofs of property, the rights and duties of men, all these are complex notions, which are made and sustained by civilized man, and interest most profoundly his hopes and fears. These are still further removed from the notions and terms more usually conceived as abstracta, but, like these, are susceptible of being ex-

Notions as simple and complex.

No simple ideas or beings in nature.

analyzed as to be carried back to living beings. But these all are complex notions, and some of them exceedingly complex in their constituent elements. If we consult a dictionary, and run the eye down its lists of words, we shall be surprised to find how large a portion of them stand for these artificial creations, these complexes of abstracted properties.

§ 391. Notions are technically distinguished by their relations of *content* and *extent*, or, as they are often termed, their *comprehension* and *extension*, their *depth* and *breadth*.

These relations grow out of the very nature of the notion, as will be seen by our definitions. A notion cannot be a notion, unless having these two relations. It can neither be formed nor used unless both these relations are considered. Indeed, we have already considered both in the analysis previously given. But it is none the less important that they should be clearly explained and precisely defined.

Content defined. The *content* of the notion is the attribute, or attributes, of which it consists. It is its contained attributes considered as a unit or whole. Those notions, whose content we have the most frequent occasion to consider, are complex notions. Still a simple notion has a proper content in the single attribute which, when conceived as common, is made a concept. Such complex notions as *chalk*, *snow*, *milk*, *felony*, *burglary*, *theft*; *man*, *spirit*, *body*, *soul*, *legislation*, *monarchy*, *republic*, *a state*, etc., have so manifestly a sum of contained attributes, that it is with especial propriety that we speak of their *content*.

These constitute their meaning or import. When these are fully stated, the notion is defined. They are also called the *essence*, or *essential* constituents, of the notion, because they make up or form its being as a thought-product or thought-creation. The failure to distinguish this special use of the word *essence*, and the readiness with which it has been confounded with real existence, has been a fruitful source of confusion and controversy among metaphysicians.

Extent defined. The *extent* of a notion originally and properly signifies the number of individuals to which it is applicable. If we could know, by actual census, how many horses or men there are at any time existing, their sum would be the extent of the notion horse. We rarely, however, have occasion to go to individuals; for these are divided again and again into larger and smaller groups, to each of which there is a fixed notion and name. These divisions are effected by adding to the content of the notion, which includes a greater number of individuals, an additional attribute—in the case of the horse, an attribute of color, perhaps; and we have a new content, *white horse*, *black horse*, etc., giving an extent of fewer individuals. In many cases, we designate the concept thus newly-formed by a separate name, as *pony*, for a small horse, *charger*, *hunter*, *roadster*, etc. So trees are divided by means of notions, whose content is given as *deciduous* and *non-deciduous*, i.e. whose content is expressed by a single word, as *fire*, which again are divided into *pin*es, *hemlocks*, *spruces*, each having some

attribute not belonging to the content indicated by the word *fir*, or *fir-tree*.

In consequence of these divisions or groupings of individuals by broader and narrower divisions, the extent of the notion in actual use always stops short with subordinate groups, and does not carry us down or back to the included individuals. These individuals are always intended, however, and the subordinate classes are said to constitute the *extent*, because they, in their turn, are applicable to and comprehend individuals.

Extent usually
measured by
species.

Inasmuch, however, as, for purposes of thought-knowledge, it is of little consequence how many individual men are living, questions of the actual extent of a notion rarely concern any thing beside the subordinate classes which make up the greater whole. We do not count up the men who are alive—we do not ask whether those who are dead or those not yet born, ought to be added to the extent of the notion man. We simply propose to know what are the subordinate classes, as far as they have been divided and subdivided; and having answered these questions we rest content till new discoveries or more careful attention require or warrant a still lower subdivision.

Definition and
division.

As the *content* of a notion is exhibited by *definition*, so the *extent* is given by *division*. This division is effected as the indirect consequence of adding to the content of the notion a new attribute, which immediately narrows its extent. The adding a new attribute, or new attributes, for this end, is called *determination*, or the act of bounding off, or limiting.

Content inverse-
ly as extent.

It follows that, as the *content* of a notion is increased, its *extent* is diminished. Hence the maxim: the content is inversely as the extent; and conversely. In other words, the greater the extent, the smaller is the content; the greater the content, the smaller is the extent.

These distinctions and maxims obviously apply to the concepts of *abstracts* and other fictitious entities created by the human mind. Inasmuch as all these are treated as though they were real beings, these concepts admit both of the relations of content and extent. Thus, *gratitude* and *republic* are both capable of definition and division. The content of each can be given by defining the attributes which make up its essence, and their extent by enumerating the several species or sorts into which each can be divided. Yet neither are real beings.

All the properties of the notion which we have thus far considered, seemed to be involved in the very nature of the product, and in its application to its appropriate objects. They are none the less important or true for that reason.

On reflection, it will also be found that these properties and relations have already anticipated and provided for the whole theory of *classification*.

Classification—
how does it
arise?

§ 392. In forming the notion from, and applying the notion to, individual objects, the intellect *classifies* these objects; that is, it groups them into divisions which are *broader* and *narrower* in their extent; and of course *higher* and *lower* when ranked according to their place in a system. This consequence follows both from

the fact that nature has so constructed individual beings that they are capable of being grouped into larger and smaller divisions, by means of their resembling attributes; and from the tendency in the human soul to meet this fact of nature by the desire to view objects in a corresponding orderly arrangement. It follows as a necessary consequence that the mind when it thinks the individual objects of its knowledge by means of concepts or notions must of necessity classify them.

Children classify
rudely.

The first efforts at classification are necessarily rude and imperfect. Children when left to themselves group together objects in very strange connections and discern resemblances between things which older people never would think of connecting. The number or range of objects to which they have access is very scanty—their power of attentive analysis has been little exercised, and their movements of perception and comparison are unconstrained by the classifications of others. In the poverty of their language they apply the words which they have, to the strangest uses, on the very slightest and the most whimsical analogies.

They soon learn better, as we say. That is, they take from older persons the conceptions and classifications which have been made before them. In other words, they think over again the concepts that are made ready and presented for their use, in the words of which they learn both the import and the application. They do not learn these words from memory alone, but the words guide them in the direction in which they are to attend and indicate what they will find. Thus in learning to talk they are constrained to fall in with those classifications which previous generations have made before them, and have recorded in the language which they have left behind.

How savages
classify.

Savages do not classify under the same restraints. Now and then an opportunity occurs in which we can observe the movements of their minds. When novel objects are presented to them, they usually seek out some concept or word already known and familiar, and extend it to the novel object by some resemblance, however forced or violent it may be. The goats which Captain Cook carried to the Pacific Islands were called by the natives *horned hogs*: the horse on a like occasion was called a *large dog*. The *dog* and the *hog* being the only quadrupeds with which these savages were familiar, these novel animals were taken into the only concepts and names that were ready for their reception. When the Romans first saw elephants, they called the animal *bos lucas* or *lucanus*, a lucanian ox, from the province in Italy where they were first seen. It was only after countless observations and myriads of comparisons repeated for generations by multitudes of individual men, that the classifications employed in common life and the concepts designated by the words in hourly use have been reached and fixed.

The classification
of science.

§ 393. The classifications of science differ from those of common life in that they are founded on a far closer observation, and are directed by the special rules which are furnished by

scientific principles. These may be certain assumed ends, or known powers or laws of nature, which were discovered long after those classifications were perfected which are recorded in the words of common life.

The classification of animals into Vertebrates, Articulates, Mollusks, Radiates and Protozoans, and the subdivision of the Vertebrates into Mammals, Birds, Reptiles, and Fishes, is very different from that represented in the words horse, ox, whale, snake, hawk, quail, robin. Neither the so-called natural nor artificial systems of Botany give us what we know under the household names of the lily, the rose, the pink, and violet. And yet these common names do as really classify their objects as do scientific names. The concepts for which they stand are formed by the same processes and applied for the same purposes as those which science forms with greater exactness, and uses with greater rigor. As soon as concepts begin to be formed, however crude are the first products and grotesque the classifications, the mind has set off upon a path which needs only to be faithfully followed to conduct to the definitions of *Newton*, and the classifications of *Cuvier*.

Classification
not peculiar to
science.

To classify is no secret of science, no process reserved for the select few who are initiated into a magic art, but it is as universal and necessary as the act of thinking. The classifications of common life may be as rational and as useful for the ends of common life as are those of science for its special objects. They are founded on the obvious appearances of objects to the senses and the mind. They are adapted to the uses of men of ordinary culture.

What wealth of thinking does every cultivated language embody and represent! Each one of its words has gathered into its subtle essence the results of repeated and refined observations of the men who perhaps by successive efforts at last reached the concept which the single term enshrines. Many of its terms designate relations and similarities which are by no means obvious at a hasty glance, and distinctions that would not at once be detected. Even those words which we call synonymous, are distinguished by nice but real shades of differing import. If the language is copious and carefully discriminated like the Greek and the German, it is at once a representation and a monument of the thinking of the race who used, and by using developed it into its consummated perfection.

What the nomenclature of
a science represents.

In like manner the technical nomenclature of a single science when finished and arranged, is a transcript of all the discriminating thoughts, the careful observations, and the manifold experiments by which the science has been formed. It represents in brief, all the most careful definitions and the most complete and best classified divisions which the devotees to its special objects have perfected by their labors.

The chief point which these observations confirm, is that the concept is of necessity a classifying agent. We cannot form the concept by combining individual objects through common attributes, without thereby separating them from other objects not thus distinguished.

Classification
and systematization.

§ 394. Classification is nearly allied to systemization. The division of objects into classes which are broader and narrower, has a close affinity with their orderly arrangement in classes which are higher and lower, through a succession of divisions and

subdivisions. Both result from the application of notions in their extent to existing objects, or to objects which are conceived to exist. In the one case we take a single concept perhaps, and by the determination of its content, we divide its extent into several that are subordinate. But when we arrange objects by a system, we pursue the same method by a succession of subdivisions downward and generalizations upward till we obtain a symmetrical arrangement of the whole. To reduce our knowledge of any number of individual objects to such a system, we must use efforts similar to those which result in the division of a single class.

Nature provides for the realization of such an aim by the constitution of things; by the distribution of attributes with which existing objects are invested; and the ordering of the powers and laws under which phenomena occur. She inspires to the effort to reduce our knowledge to this form, by giving us the anticipation and belief that we shall find objects so constructed, and by rewarding every confirmation of this expectation with special satisfaction.

The relation of
both to knowl-
edge.

Classification and systemization, are the characteristics and consequences of all thought-knowledge and preëminently of scientific knowledge. They are indispensable to enable us to grasp individual facts and to retain our observations. They are an intellectual convenience and an intellectual necessity. But they do not constitute the whole of thought or the whole of science. Though scientific knowledge is of necessity classified and arranged knowledge, yet much more than this is true of it. The order, beauty and symmetry of systematic arrangement is but the external indication and accompaniment of profounder relations than those of the similarity of attributes, making possible notions of fuller and scantier content, and of wider and narrower extent.

We have entered within the threshold of our analysis and comprehension of thought-knowledge, and yet the light which shines from the inner sanctuary casts its radiance upon the objects which are the nearest to our view. Other acts remain for us to consider, involving profounder relations in the constitution of the universe, in the methods and forms of our thinking, and in the products which this thinking evolves.

How much do we
gain by knowing
by concepts?

§ 395. It will not be amiss, however, to ask at this stage of our inquiries, what addition do we make to the knowledge which we gain by perception and consciousness by superinducing upon it the acts or processes of thought which we have thus far considered? What do we know more about an object seen or experienced, by generalizing its attributes, determining its class, or assigning to it a name? We may answer this question by asking two or three others. What more does a man know about a single apple by calling it an *apple*, a *fruit*, a *plant-product*, an *organized being*, than he does by looking, feeling, tasting, and smelling it? Or one might as properly ask, what more does a mechanic know of the parts or the whole of a machine, as of a turning-lathe or steam engine, than does a savage? The eye of the

latter may be far more keen, and his power of observation as sense-power may be more analytic and discriminating, and yet the mechanic, by the aid of concepts and names, sees far more than does the savage without them. What more is known in both these cases by the acts of thought? We answer, their common relations, *i. e.* properties, attributes, and uses.

When we think or intelligently say of a sense-object it is an apple, we both think, and impliedly say of it, it is like a multitude of other sense-objects, in many most important respects, as of color, taste, size, etc. When we think or know it to be a fruit, we enlarge still more widely the sphere or extent of the objects to which it holds relations. So when we think it to be a plant-product. The same is true of the greater knowledge which the mechanic possesses of the parts or the whole of a turning-lathe, or a steam-engine. He knows the objects to which these are related, or as we usually say, the relations of these objects, and the more numerous are the concepts under or by which they are known, the wider is the sphere of this knowledge.

§ 396. The circumstance that classification results from the thought-process, has a greater importance than would seem at first to be indicated. As we class the objects, as a pippin, an apple, a fruit, a plant-product, an organized being, we do more than discern at each step new and more widely-reaching relations,—we seem to gain a deeper insight into the nature of the perceived object. This is owing to the circumstance, that the properties and relations which extend the most widely either are or indicate powers and laws which it is the problem of man to discover and apply as the elements and objects of scientific knowledge.

The significance
of naming ob-
jects.

That was no inconsiderable act which was signified by the record which describes the various living animals as brought to Adam that he might name them. The capacity to name implied an insight into their nature. For this reason it must of necessity be true, if we suppose the original man to have been endowed with the requisite discernment, that “whatsoever Adam called every living creature that was the name thereof.” It seems to be a trifling thing for the child to be able to affix suitable names to the objects and beings which first attract its attention. At first thought the act is trivial, mechanical, parrot-like, as it were, to attach an articulate sound to one or more similar objects; but when we reflect upon it as implying the power, as already in being or as being stimulated to efficient activity, of intelligently applying this name to a large number of objects which are in many respects unlike and yet alike, it becomes an act of the gravest import. It indicates a most important development of the soul’s action, an awakening of it in a new direction, and the evolution of a new product.

When the child asks, What is it? meaning thereby, What is it called? it really asks, What is the nature, or what the relations of the object? When the name is given in reply, and the child is satisfied, it has a better reason to be content than it seems to have, or than it itself knows of, for in the name it has the means of enlarging its knowledge of the objects to which

the name belongs, as it learns one by one what they are, and notices in what they are alike, and in what they are unlike.

The varying import of the concept Salt.

That the name does, as it were, take up into itself and is ready to give up and reproduce the knowledge of relations indicated by the concept can be easily illustrated by the import of any common term, as for example, *Salt*. The child first learns to apply this word to a certain well-known substance, the common table salt, and to recognise in this article, however different it may be in solidity, color, taste, certain common characteristics which entitle it to this appellation. It afterwards learns to apply it to other substances, which on account of their pungent taste and other properties, as crystalline character, the processes by which they are formed, etc., have been vulgarly called salts. This involves, of course, an enlargement of its *extent*.

When, with the progress of chemical science, more is known about table-salt, *e. g.*, that it is the chloride of sodium, the import of the concept is changed and enlarged in accordance with this new and more accurate knowledge. Or it may be stated more exactly, we have another concept with the same extent and name.

It might be added that if the term takes into its import a metaphorical signification, as of sprightliness or wit, then this is also indicated by the word. By such an example we see and show how great an amount of relative knowledge is represented in a single concept, and how the same concept and word enlarge themselves to receive and represent the added import which progressive knowledge discerns and acquires: both expanding their capacity to store away and retain all that the mind appropriates.

That was no slight achievement of Aristotle, to seize upon, bring out and establish the truth that the concept of an object either declares *what it is* or at least indicates the direction which must be taken in order to find this. The concept is the permanent *what-ness* or *what-sort-of-ness*, which may be thought of the things to which it is applied. It is the *τὸ τί ἦν εἶναι*, *i. e.* its real and permanent nature. To ask what a thing is, according to Aristotle, is to take the first step and perform the first of the processes which are essential to its complete mastery. It is to propose the first of those questions, the answers to all of which carry the mind through the entire circle of scientific knowledge.

The other two are *ἀπὸ τί* and *οὐθενός*, *viz.*; *whence*, or by what causes or means, and *what for*, or *to what end* or design,—the first giving the relation of efficient, and the second that of final cause.

Aristotle also recognises the intimate connection of the concept with the word, calling the two by the same term, *ἡ λέξις*.

For an explanation of the phrase *τὸ τί ἦν εἶναι* and of the one nearly allied, *τὸ τί ἐστιν* see Trendelenburg *De an.* p. 182 sqq., also *Rhein. Mus.* 1838. Heft 4, p. 457 sqq., also *Geschichte der Nat.* p. 34 sqq.

Relation of knowledge by concepts and by intuitions.

§ 397. Thought-knowledge is sometimes contrasted with presentative or intuitive knowledge to its disadvantage, by such representations as these: No definition can give any adequate impression of the objects which we discern by perception or experience in consciousness: A moment's inspection of an object, as of a turning-lathe, a steam-engine, or any implement of labor or art, is worth more than the most elaborate description by words, or the most precise and full enumeration of its constituents. So it is often said, an hour's experience of mental or moral activity, and the actual exercise of the love of the right or of God, is worth more than a whole system of ethical or religious philosophy.

This in one sense is true, in another it is false and misleading. Simple inspection by perception can give very little knowledge of the objects

named. It is inspection or experience attended and enlightened by thought, which instructs the mind. It is perception, with comparison of like or unlike properties, powers and adaptations, which is unfairly contrasted with definition and description.

It is true, that thought with intuition is greatly to be preferred to thought without intuition but in cases where intuition cannot be had, the definition or description by concepts and terms are no mean substitute. Often they accomplish that which is of most importance; the conveyance to the mind of a knowledge of those relations which are of the greatest significance, as of common properties, common causes, common laws, and common uses; all of which are, for the purposes of science and of practice, not only the most important relations but those only which are of any considerable use. Intuition gratifies other capacities, as those of sensuous or emotional pleasure. It both satisfies and stimulates the curiosity. It enables the inquiring or sceptical mind to verify the assertions of others by personal observation. It brings the opportunity to make fresh and independent judgments and inductions of our own. But the end of intuition is not found in itself, but in the thought-knowledge to which it excites and directs.

The *what* which the concept and the word both propose to communicate, is not the direct observation which presentation gives, but the higher and more comprehensive knowledge which thought aims to achieve. It is not the knowledge that a *being is*, but the analytic and comparative knowledge of its *relations*.

CHAPTER III.

THE NATURE OF THE CONCEPT.—SKETCH OF THEORIES.

IN the preceding chapter we have considered the nature of the concept in a general way, so far as was required in the analysis and explanation of the psychological process by which it is formed. As a metaphysical and logical question it has been fruitful of discussion in the schools of ancient and modern philosophy. From Plato to John Stuart Mill, it has been the perpetual theme for discussion and controversy. The history of the various theories which have been held is not merely interesting as a subject of curious speculation, and as the key to much of the history of philosophy; but it is most instructive as enabling us to understand the nature and reach of language, as well as the grounds of our faith in philosophy itself, and in the special sciences of which philosophy is the foundation. We return to it a second time for more careful consideration, as a necessary preliminary to which we shall give a brief sketch of the history of the theories which have been taught in the ancient and modern schools.

§ 398. The nature of the concept and its relation to real or existing objects has been the occasion of endless speculation, of fantastic theories, and of sharp and persistent controversies in every period distinguished by philosophical inquiry. *Socrates* was the first to insist upon the importance of forming concepts of the objects of our knowledge in order that the permanent and essential might be eliminated from that which is accidental and transitory in individual objects. But he taught little or nothing in respect to the nature of the concept, or of that in the object to which the concept is the counterpart or correlate. *Plato* took up the inquiry where *Socrates* left it; insisting more abundantly than he upon the necessity of this higher knowledge, and showing that in attaining it we must define and divide—must go from the individual to the general, by successive inductions, and so on from one step to another, till we reach that which exists of and

The doctrines of
Socrates and Pla-
to.

by itself—that which is alone the permanent object of [true] knowledge. This is the *idea ἡ ἴδιαι* or *τὴ εἰδος*. We attain to this by forming separate concepts, which we successively test and reject, till at last they reveal the *idea*. This *idea* is, however, not itself a concept, *νόημα*, though concepts enable us to find it. It is rather that in the object which prompts us to form those tentative concepts which enable us to discover the *idea* itself. But what this *idea* is, and what are its relations to the concept, he does not accurately teach; where it exists he does not assert; whether in the object itself, or in the mind of the Creator, or in the mind of each thinking man, he does not define. He seems to teach that *ideas*, or *the idea*, have an existence and essence separate from all these, that they are eternal and incorruptible, existing before all temporary and perishable beings, and imparting to the perishable and phenomenal in these beings all their dignity and interest. Ideas are realities, things and events are their shadows. Ideas have a sphere and place of their own, etc., etc. But whether by these representations, he intends only personification and poetic fiction, or sober scientific definition, is not always easy to decide. This much is certain; that the *idea* with Plato stands for the objective correlate of the concept so far as the *idea* is within our reach, and that it is by obtaining concepts of objects as we may, that we approximate towards the knowledge of *ideas*. To the nature of the concept itself, as a psychological product, and its relation to the real or the ideal, he gives little attention, and of it furnishes no definition. Aristotle, following Plato, justly charges him with treating his *ideas* as existences or substances which could exist separately from individual objects or things, and compares these hypostasised entities to the anthropomorphic deities of the Greek mythology, which must assume the forms of men, and when they did so were only known as wearing the garb and as performing the actions of men, and yet, separately from these forms, could not be known by mortals.

§ 399. As against Plato, Aristotle insists that the only real beings or substances are existing beings or things, the *πρῶται οὐσίαι*, as he calls them. He is distinctly aware that there are other sorts of beings besides these. The *δεύτεραι οὐσίαι* are distinctly discriminated from the *πρῶται οὐσίαι*, or individual beings. He aims to show in what sense the former are so called, and how they are related to real beings, or, in modern phraseology, to show the relation of concepts to real existences. His aims are, however, more satisfactory than his achievements. This is explained by the fact, that his treatment of the concept is metaphysical and objective rather than psychological and subjective. That is, he treats the concept as an object of the mind's analysis and contemplation, rather than as a result of the mind's producing—as a product already created, rather than as a result which the mind must evolve in accordance with the laws of its activity and the relations of the objects concerned. Hence he left the problem unadjusted, as a legacy to his disciples—a metaphysical question to be discussed and debated, and not a question of fact and psychology to be inquired into by the study of the mental operations as revealed to consciousness.

Psychologically, Aristotle goes so far as to discriminate the *πρῶται οὐσίαι* from the *δεύτεραι οὐσίαι*. *Οὐσία δὲ ἴστιν ἡ κυριώτατα τε καὶ πρῶτος, καὶ μάλιστα λεγόμενη, ἥ μὲν καθ' ὑποκειμένου τιος λέγεται, μὲν ἐν ὑποκειμένῳ τι καὶ ἔστιν, ὅλον δ' οὐκ ἀσώματος, καὶ δ' οὐκ ἴππος.* Cat., ch. iii. n. 1. The first is the only real being or substance. The second is not properly a substance, but only in appearance, it really is the last analysis signifies a quality. (Cat., chap. iii. n. 16.) In modern phrase, the *δεύτεραι οὐσίαι* are Universals, and these are the products of the mind's own activity, and separately from this, have no proper existence of their own. They are resolvable into, and signify some quality. All the being which they have comes from this, that the mind asserts or predicates certain qualities of real beings, or *πρῶται οὐσίαι*. Hence, in a derived, secondary, or representative sense, they themselves are called beings; the beings of the mind, or secondary beings.

But Aristotle does not always, nor usually hold to this distinction. Whether or not it was clearly present to his own mind, may be a question in respect to which some difference of opinion should fairly exist. It is certain that he does not always impress it forcibly upon the minds of his readers. When he discusses the form and matter of substances or beings, *i. e.*, when he gives a metaphysical analysis of the essential elements of being, it is not certain or clear, whether he has in mind real beings, *i. e.*, individuals, or secondary beings, *i. e.*, Universals. The distinction between the *εἶδος* and *ἕλη*, or form and matter, was thus explained. Matter cannot exist without form. For every being has some determinate form. There can be no form without matter. The one requires the other. The two are correlates, seeking each other, as Aristotle figuratively speaks, by a natural appetency. The form only is conceived by the mind. What the mind conceives of a being is its essence, *τὸ τί ἦν εἶναι*. In modern language the concept is made up of the essential qualities that are common to several individuals, omitting those which are undiscriminated. Thus far the distinction is applied to individual substances or beings.

When form and matter are affirmed of the *δεύτεραι οὐσίαι* as especially discriminated from the *πρῶται οὐσίαι*, the distinction is illustrated by the logical definition or view of the species. Here the species as a determinate form of the genus, is itself the *εἶδος*—*i. e.*, the *differentia*, and that which is essential and definable. The genus is the matter; it is supposed but not defined, as when we speak of the whale or the shark as a species of animal, animal is the indefinite matter, common to all these beings indiscriminately—what is thus common takes form in the whale, the shark, etc. The species as conceived by Aristotle, was, however, not the so-called nominal essence such as can be constructed by the mind *ad hōmīnem* by the addition of any differentia to any combination called generic, but it was an actually existing class—predominantly such as exist in the animal creation. The permanent characteristics of such, *i. e.*, their logical properties

or differentia, &c., their real conditions, were taken as separate forces or forms, which, acting with matter, produced or constituted the species. Generally—the matter is the form *ἐν ἑαυτῷ*, the form is the matter *ὑπερβολῇ*—the one is possible and tending toward reality; is waiting for appropriate conditions, as we should say. The other is actual: that is, the conditions being present, the result consequently follows in a realised or actualised form. The completed realisation *ἐν ὑπερβολῇ*, of the matter *ἐν ἑαυτῷ* is the *ἰδεάτης*.

Aristotle set out with the determination to avoid those personifications which so abound in Plato. But he did not entirely succeed. Should we concede that he was not betrayed himself into hypostasising these metaphors, he did not secure his disciples from this error. So it happened that the ideas of Plato and the forms of Aristotle were both regarded as actual realities, and as such, furnished fruitful material for the subtleties and controversies of their earlier disciples and commentators, in the decadence of the Greek philosophy.

Porphyry. 238-265. His questions.
Boethius. 470-524.

§ 400. It was, however, among the scholastics of the middle ages that such discussions became conspicuous, in the schools of the Nominalists, the Realists, and the Conceptualists. The immediate occasion of these discussions and controversies was furnished by a passage from Porphyry, in the preface to his Introduction to the *Categoris* of Aristotle. This Introduction was translated from the Greek by Boethius, and this passage became the problem for the different sects which we have named—who received their appellations from the different solutions which they gave to it. “*Mox de generibus et speciebus, illud quidem sive subsistent, sive in solis nudis intellectibus posita sint, sive subsistentia corporalia sint an incorporea, et utrum separata a sensibilibus posita circa hæc consistentia dicere conabor. Altissimum enim negotium est hujus modi et majoris egens inquisitionis.*” In other words, the questions which naturally suggest themselves concerning Universals are the following:

‘Have Universals a separate existence or do they exist in the mind only? If they have a separate existence, are they corporeal or incorporeal? Are they separable from sensible objects or do they subsist in these only?’

The Realists.
The Conceptualists.
The Nominalists. The motto of each.

The *extreme Realists* answered these questions in the spirit of Plato, or rather of the doctrine which Aristotle ascribed to Plato, viz.: that Universals have an existence that is separate from and independent of individual objects. They even contended that they exist before them, in rank and creative power, or at least in point of time. These views were formulated in the motto *Universalia ante res*.

The *moderate Realists* adopted the creed of Aristotle that Universals have a real existence, but only in individuals. Their motto consequently became *Universalia in re*.

The *Conceptualists* and *Nominalists* agreed in this that individuals alone have real existence; and that Universals, both genera and species, are formed by the mind, by bringing together many similar objects, and designating them by common terms.

They differ in that the *extreme Nominalists* held that the name only is general and is employed to avoid an indefinite number of proper names which would be otherwise required; while the *Conceptualists* interposed a concept between the name and the objects collected into a class. The motto of both Conceptualists and Nominalists was *Universalia post res*.

§ 401. The differences of opinion that ripened into these separate philosophical sects began to be manifest in the ninth and tenth centuries. It was not, however, till the second half of the eleventh that different philosophers and theologians were known by these appellations; and that the doctrines themselves became the occasion of earnest and bitter strife. These reappeared at intervals and were not finally terminated before early in the fourteenth.

The Scholastics.

(*Heiricus*) *Erie of Auxerre*, in the early part of the ninth century, wrote as follows: “*Sciendū autem quia propria nomina primum sunt innumerabilia; ad quæ cognoscenda intellectus nullus seu memoria sufficit, hæc ergo omnia coartata species comprehendit et facit primum gradum, qui latissimus est, etc., etc., etc. Sed quia hæc rursus erant innumerabilia et incomprehensibilia, alter factus est gradus angustior, qui constat in genere quod est animal, surculus et lapis; iterum hæc genera, in unum coacta nomen, tertium fecerunt gradum arctissimum et angustissimum, utpote qui uno nomine solum modo constet, quod est *uſia*.*”

Erie of Auxerre.
9th Century.

Again, “*Si quis dixerit album et nigrum absolute sine propria et certa substantia, in qua consistet, per hoc non poterit certam rem ostendere, nisi dicat albus homo vel equus aut niger.*”

Still further, an unknown writer, either *Rhabanus Maurus* or a scholar of his writes as follows, on Porphyry's Introduction: “*Res enim non predicatur. Quod hoc modo probant: si res predicatur, res dicitur, si res dicitur, res enunciat, si res enunciat, res profertur; sed res proferri non potest, nihil enim profertur nisi vox, neque enim aliud est prolatio, quam æria plectro lingue percussio.*”

Roccellinus.
† 1106.?

Roccellinus or *Roccellin*, canon at Compiègne in the second half of the eleventh century, was the first recognised Nominalist. His teachings chiefly attracted attention in consequence of the application which he made of them to the doctrine of the Trinity. His views of this doctrine were condemned by a church council at Soissons, 1092, and he retracted the doctrine which gave offence but seems afterwards to have taught his

Nominalistic views without molestation. But he founded no school and left no followers among the teachers in the schools. Roscellin was earnestly opposed by his contemporary, Anselm of Canterbury. William of Champeaux represented the most extreme realism in France, and Abelard also, though much less extreme as a Realist, rejected the doctrines of his teacher Roscellin.

Roscellin left no writings and only a letter on the Trinity to Abelard. We are forced to take our view of his opinions from the accounts of his opponents. Anselm says: "Illi nostri temporis dialectici, immo dialectici heretici, qui non nisi flatum vocis putant esse universales substantias; qui colores nihil aliud queunt intelligere quam corpus, nec sapientiam hominis aliud quam animam." (De fid. trin. c. 2.)

William of Champeaux. 1070-1121.

William of Champeaux studied under Roscellin, but adopted extreme Realism. Abelard says of him: "Erat autem in ea sententia de communitate universalium, ut eandem essentialiter rem totam simul singulis suis inesse adstrueret individuis, quorum nulla esset diversitas sed sola multitudini accidentium varietas." To this Abelard objects—the same substance must then admit various accidents which are incompatible with one another, and the same must be in different places. William, on this, modified his statement by substituting *individualiter*, or as others read, *indifferenter*, in place of *essentialiter*.

Abelard, 1079-1142.

Abelard, 1079-1142, who studied under both Roscellin and William of Champeaux, avoided the extremes of either, without committing himself to a very definite and consistent doctrine upon the subject. He taught that the universal is not simply *res* but *sermo*, and has therefore been called a Conceptualist. John of Salisbury, his pupil, says of him: "Alius sermones intuetur et ad illos detorquet quicquid alibi de universalibus meminit scriptum; in hac autem opinione deprehensus est peripateticus Palatinus Abelardus noster; rem de re predicari monstrum dicunt." He says himself: "Nec rem ullam de pluribus dici sed nomen tantum concedimus." On the other hand he says: "Nihil est definitum nisi declaratum secundum significationem vocabulorum."

verbalibus meminit scriptum; in hac autem opinione deprehensus est peripateticus Palatinus Abelardus noster; rem de re predicari monstrum dicunt." He says himself: "Nec rem ullam de pluribus dici sed nomen tantum concedimus." On the other hand he says: "Nihil est definitum nisi declaratum secundum significationem vocabulorum."

What this signification is and on what in things it depends, he does not explain. In respect to the pre-existence of Universals, he accepts the doctrine of Plato, under the form in which he conceives it, by making the ideas which are the forms of things to exist eternally in the divine mind. "Ad hunc modum Plato formas exemplares in mente divina considerat quas ideas appellat et ad quas postmodum quasi ad exemplar quoddam summi artificis providentia opera a est." (Introd. ad Theol. I., p. 287.) "Sic et Macrobius. Somn. Scip. I., § 14. Plato nem insecutus mentem Dei, quam Graeci Noyn appellant, originales rerum species quas ideas dicte sunt, continere meminit antequam etiam, inquit Priscianus, in corpora prodirent, h. e. in effecta operum provenirent." (Jb. II., p. 1095.)

Albertus Magnus. 1193-1280.

Albertus Magnus reconciles the three doctrines in respect to Universals, by saying that they were *ante rem* in the divine mind, in *re* as connected with individual objects, and *post rem* as separated by the process of abstraction, i. e., as concepts in the mind of man.

"Et tunc resultant tria formarum genera; unum quidem ante rem existens, quod est causa formativa; aliud autem est ipsum genus formarum quod abstrahente intellectu separatur a rebus." (De nat. et orig. an. tr. I. 2.) "Ese universale est formas et non materia." (De int. et intell., I. 2, § 3.)

Thomas Aquinas. 1226-1274.

Thomas Aquinas made similar distinctions and taught the same doctrine: "Formas que sunt in materia, venerunt a formis que sunt sine materia et, quantum ad hoc, verificatur dictum Platonis, quod formas separate sunt principia formarum que sunt in materia, hoc posuerit eas per se subsistentes et causantes immediate formas sensibiles; nos vero ponimus eas in intellectu existentes et causantes formas inferiores per motum oculi." (Con. Gen., III. 24.) "Credidit Plato quod forma cogniti ex necessitate sit in cognoscente eo modo quo est in cognito, et ideo existimavit quod operaretur res intellectas hoc modo in se ipsas subsistere, sc. immaterialiter et immobiliter. (Sum. theol., I. 84.)

"Quia hoc principia speciei vel generis nunquam sint nisi in individuis, tamen potest apprehendi animal sine homine, asino at aliis speciebus." (De pot. an., c. 6.)

"Universalis ex hoc quod sunt universalia non habent esse per se in sensibilibus, quia universalitas ipsa est in anima." (De Universalibus, tr. 2.)

John Duns Scotus. † 1308.

John Duns Scotus agreed with the two preceding in respect to the nature of Universals and their relation to matter, with one exception. They made the principle of individuation to lie in the matter by virtue of which when united to the form, i. e., the Universal, each individual came to be what it is. But Duns Scotus recognised what he called a separate principle besides, viz., the *haecceitas*. The *haecceitas* in conjunction with the *quidditas* constitute the individual thing.

William of Ockham. † 1347.

William of Ockham was distinguished as the reviver of the Nominalistic theory. His doctrine is expressed in the following extracts: "Entia non sunt multiplicanda præter necessitatem. Sufficient singularia et ita tales res universales omnino frustra ponuntur. Scientia est de rebus singularibus, quod pro ipsis singularibus termini supponunt, i. e., tantidem significant.

A Universal is defined by him as "*conceptus mentis significans univocè plura singularia*," having existence in the mind, not *subjectively* only, but also *objectively*.

"*Idee (i. e., Universals in the divine mind) sunt primo singularium et non sunt specierum quia ipse singularia sola sunt extra producibilia et nulla alia.*"

The tendency of Occam's theory was to limit our scientific knowledge of God and to exalt faith as the source and principal foundation of theology. Occam was the last who needs to be named in this sketch of the history of opinions. The discussion of the subject did not cease with his death, for his opinions were represented and defended by able disciples. But as Scholasticism itself gave way before the various influences which enlarged the knowledge and occupied the attention of the learned, the discussion of this question became less important.

These discussions not deserving of neglect or contempt.

§ 403. It is very common to think and speak with wonder, if not with contempt, of the strife between the Nominalists and Realists. The modern critic often congratulates the men of his own times that they are not distracted by controversies at once so trivial and fruitless. He asks himself how it could be possible, that what seems to him only a metaphysical subtlety or a trivial logomachy, should have occasioned so great acrimony between the parties concerned, and should have even embroiled their rulers in both church and state, with one another in bitter and bloody contention. The proper answer to this question is found in the consideration, that the logical opinions taught were immediately applied to theological doctrines, and the inferences which the opposite opinions warranted in fact or were supposed to warrant, in respect to the received doctrines of the church, invested them with the supremest importance. The Nominalist was persecuted by the Realist, and the Realist denounced the Nominalist—not as a Nominalist or Realist, but as teaching principles which, in their consequences, were deemed hostile to the doctrines or the authority of the church. Viewed in this light, the earnestness and bitterness with which these disputes were conducted should occasion no surprise; certainly no greater surprise than that the philosophy of Mr. Hume, Mr. J. S. Mill, Mr. Herbert Spencer, or Mr. Mansel should now be judged by its relations to theological opinion.

But the narrow range which this discussion took, and the endless reiteration of the same propositions and the same arguments, are criticised as inexplicable. These features of the controversy are not surprising to one who reflects upon the scanty literature which was at the command of the schoolmen, and the extreme deference which they paid to the authorities whom they acknowledged. Their literature was at first a portion only of the logical treatises of Aristotle, of course in Latin versions, and a part of a translation of the *Timæus* of Plato. The chief source of their knowledge of the ancient systems was the writings of St. Augustin. There was none of that enlarged knowledge of man which the classic literature and ancient history might afford, none of that knowledge of nature which the observations of Aristotle, Pliny, and Strabo might have given, none of that independence of judgment which a better method of observing the facts of nature would have ensured. The education of the schoolmen was logical on the narrowest foundation; and as soon as dexterity in logical gymnastics was secured, it was shut up to the sole service of training others to expound and defend certain dogmas already fixed and defined by the church.

The subject matter was not trivial, for it is yet under discussion. From Aristotle to Mill, from Plato to Hegel, the same questions have been discussed again and again, and with as much earnestness now as then. Indeed, the discoveries of modern science and the modern questions respecting the foundations of Induction and of Theological Truth, invest these questions at the present moment with a deeper interest and a more profound importance than they could possibly have had when discussed by Roscellin and Anselm, or by Abelard and Occam. Our respect for the schoolmen will not be diminished when we trace the progress of this controversy in modern times and among recent philosophers.

Modern Philosophers. Thomas Hobbes.

§ 403. In modern times the diversities of opinion in respect to the nature of the concept have been as great, and the controversies well nigh as active as they were among the schoolmen. The same questions have in fact been agitated, and the same difficulties encountered, with this difference—that the form which these questions have taken has been more generally psychological, rather than metaphysical. This was no more than was to be expected from the general course of modern philosophy. In the more recent German speculations, the logical and metaphysical direction of thought has preponderated over the psychological and inductive.

Our sketch of these opinions begins with Hobbes, a Nominalist of the extremest school, of whom Leibnitz says, *De Sile*, etc.: "Ut credam ipsum Occamum non fuisse nominaliorem quam nunc est Thomas Hobbes, qui ut verum fatear, mihi plusquam nominalior videtur." In his *Human Nature* (c. 5, § 6) he says: "The Universality of one name to many things hath been the cause that men think the things themselves are universal; and so seriously contend that besides Peter and John and all the rest of the men that are, have been, or shall be in the world, there is something else that we call man, viz.: *man in general*, deceiving themselves, by taking the universal or general appellation for the thing it signifieth." * * * "It is plain, therefore, there is nothing Universal but Names." In *The Leviathan* (p. 114); he says: "There being nothing Universal but names, for the things named are every one of them individual and Singular, one Universal name is imposed on many things for their similitude in some quality or accident."

John Locke.

§ 404. Locke, on the other hand, was a Conceptualist. That he holds to the power of the mind to form abstract ideas is evident from his direct assertion in the *Essay* (B. IV c. vii. § 9). "Does it not require some pains and skill to form the *general idea* of a triangle, [which is yet none of the most abstract, comprehensive, and difficult,] for must be neither oblique, nor rectangle, neither equilateral, equilateral, nor scalenon, but all and none of these at once. In effect, it is something imperfect that cannot exist; [i. e., in fact, or actually,] an idea wherein some parts of several different and inconsistent ideas are put together. 'The true mind in this imperfect state has need of such *Ideas*, and makes all the haste to them it can, for the conveniency of communication, and enlargement of knowledge.'" That he was not a Realist appears from the following (B. III. c. iii. § 11 sqq.): " * * 'It is plain by what has been said, that *General and Universal*, below not to the real existence of things; but are the *inventions and creatures of the understanding*, made by it for its own use, and concern only signs, whether words or ideas.'" "When therefore we quit particulars the general, that rest [remain] are creatures of our own making, their general nature being nothing but the capacity they are put to by the understanding, of signifying or representing many particulars." He argues at length against the Realistic doctrine of permanent essences or species. "Whereby it is plain that the essences of the sorts, or (if the Latin term please better) species of things, are nothing else but these abstract ideas." "To be a man or of the species man, and to have a right to the name man, is the same thing. Again, to be a man, or of the same species man, and have the essence of a man, is the same thing." "I would not here be thought to forget, much less to deny, that Nature in the production of things, makes several of them alike," etc. "But yet I think we may say the sorting of them under names, is the *workmanship of the understanding, taking occasion from the similitude* it observes amongst them, to make abstract general ideas and set them up in the mind as patterns or forms [for in that sense the word form has a very proper signification] to which, as particular things existing are found to agree, so they come to be of that species, or are put into that class." That there are no real essences or forms in things he argues from the fact that different men do not always divide species or define their ideas of them alike, that it is often difficult to tell to what species some individuals belong, as whether a bat is a bird or a beast; whether a human monster is indeed a man, etc.; from the fact that all existing things are changeable and corruptible, while our abstract ideas of a circle, a mermaid, or a horse, are fixed and permanent, because they exist in the mind.

§ 405. To these doctrines of Locke, Leibnitz, in his *Nouveaux Essais*, takes the following exceptions: He denies that the essence of the species is only an abstract idea, and asserts that the generality of such ideas consists in the mutual resemblance of individual things, and *this resemblance is a reality*. (*Nouve. Ess.*, B. III. c. iii. § 11.) To the argument that different men class individuals into species diversely, he replies, that the fact that we cannot always judge correctly of the interior nature of objects by their external resemblances, does not disprove that there is such a nature or essence. (§ 14.) He defines the essence of a thing or its species, to be nothing more nor less than the possibility of that which we propound, i. e., in a definition. That which we believe to be possible is expressed in a definition. It is a nominal essence when it is possible—it is real when it is believed actually to exist, *a posteriori*, or by experience. If we knew the causes of being we should know the same *a priori*, through the reason. (§ 15.) See also *Méditations de cognitione*, etc., in which he makes a similar distinction between nominal and real definitions—the nominal giving the distinguishing marks of a thing, the real the grounds of its possible existence or truth. In the same *Essay* he is supposed by Hamilton and others to make an important distinction in respect to the nature of the concept, by distinguishing symbolical from intuitive knowledge (§ 427).

In another treatise, *De stile philosophico Nisoli*, he praises the Nominalists, and Hobbes among them (§ 28), and yet criticises their doctrine (§ 31) that a Universal is nothing but a number of individuals taken collectively, urging that the Universal is not applicable to the class taken as a whole, but to each individual of the class—or to the class taken distributively.

§ 406. Berkeley, *Introduction to the Principles of Human Knowledge*, thus attacks the doctrine of Locke. After describing the doctrine as commonly received, he proceeds: "Whether others have this wonderful faculty of abstracting their ideas, they best can tell; for myself I find, indeed, I have a faculty of imagining, or representing to myself the ideas of those particular things I have perceived, and of variously compounding and dividing them. I can imagine a man with two heads, or the upper parts of a man joined to the body of a horse. I can consider the hand, the eye, the nose, each by itself abstracted or separated from the rest of the body, but then whatever hand or eye I imagine must have some particular shape and color. Likewise the idea of man that I frame to myself, must be either of a white, or a black, or a tawny, a straight or a crooked, a tall, or a low, or a middle-sized man. . . . But I deny that I can abstract one from another or conceive separately those qualities which it is impossible should exist so separated; or that I can frame a general notion by abstracting from particulars in the manner aforesaid." And yet Berkeley, in another passage concedes the power of abstraction so far as this: "A man may consider a figure more as triangular, without attending to the particular qualities of the angles or relations of the sides. So far he may abstract. But this will never prove that he can frame an abstract, general, inconsistent idea of a triangle." In respect to generalisation also, he concedes the following: "An idea, which considered in

Geo. Berkeley
and David
Hume.

itself, is particular, becomes general by being made to represent or stand for all other particular ideas of the same sort. To make this plain by an example: suppose a geometriean is demonstrating the method of cutting a line into two equal parts. He draws for instance, a black line, of an inch in length. This, which is itself a particular line, is nevertheless, with regard to its signification, general; since as it is there used, it represents all particular lines whatsoever; . . . and so the name *line*, which taken absolutely is particular, by being a sign is made general."

Hume agrees with Berkeley, adopting nearly his language. "A great philosopher has disputed the received opinion on this particular, and has asserted that all general ideas are nothing but particular ones annexed to a certain term, which gives them a more extensive signification, and makes them recall upon occasion other individuals which are similar to them. A particular idea becomes general, by being annexed to a general term; that is, to a term which, from a customary conjunction, has a relation to many other particular ideas, and readily recalls them to the imagination. Abstract ideas are therefore in themselves individual, however they may become general in their representation. The image in the mind is only that of a particular object, though the application of it in our reasoning be the same as if it was universal." The only difference between Hume and Berkeley is, that Berkeley makes the particular idea to represent the general, while Hume adds that it becomes general by being annexed to a term which is customarily conjoined with many particular ideas, and readily recalls them. In other words, Hume introduces his doctrine of the association of ideas to explain how one idea and term can represent several objects, and become general. We shall see how this view has been expanded and re-applied by later writers.

§ 407. Reid, in criticising both Hume and Berkeley, does not give his own views in the form of a statement precisely defined. He seems scarcely to know what his own opinion is. In respect, however, to the question under consideration, and the nature of the concept, he lays down some important distinctions which are quite in advance of the doctrines previously admitted. He observes (1) that a general idea must be the product of an individual act of the mind, and in that sense and so far, is an individual, and not a general, entity. 2. "Universals cannot be the objects of imagination when we take that word in its strict and proper sense." "Every man will find in himself * * * that he cannot imagine a man without color, or stature, or shape." "I can distinctly conceive universals, but I cannot imagine them." 3. "Ideas are said to have a real existence in the mind, at least while we think of them, but universals have no real existence. When we ascribe existence to them, it is not an existence in time or place, but existence in some individual subject; and this existence means no more, but that they are truly attributes of such a subject. *Their existence is nothing but predicability, or the capacity of being attributed to a subject.*" *Essays on the Intellectual Powers. Essay V. c. vi.*

Dugald Stewart (Elements, c. iv. §§ 2, 3) adds nothing to the discussion or elucidation of the subject, except to call attention to the ambiguity of the words conception and idea, and to more than intimate that the doctrine of the nominalist is correct, that we can neither generalise nor reason except by the aid of language.

§ 408. Brown (Lectures 46, 47) avows himself to be a conceptualist, and contends that all the nominalists have either in fact admitted or unconsciously implied the truth of this doctrine. He distinguishes three steps or elements in the generalising process (1) 'the perception or conception of two or more objects, (2) the relative *feeling of their resemblance* in certain respects, (3) the designation of these circumstances of resemblance by an appropriate name.' He criticises some expressions of the conceptualists as incautious, particularly the use of the word *idea* to express "the feeling of resemblance," because this word "seems almost in itself to imply something which can be individualised and offered to the senses." "The same remark may, in a great measure, be applied to the use of the word *conception*, which also seems to individualise its object." "The phrase *general notion* would have been far more appropriate." "Still more unfortunate is a verbal impropriety in the use of the indefinite article." "It was not the mere general notion of the nature and properties of triangles, but the general idea of a triangle of which writers * * have been accustomed to speak." This has exposed the doctrine of general notions to ridicule, such as Martinus Scriblerus is made to use against Locke.

We may add that the language which Brown employs continually in such phrases as "the *feeling of resemblance*," has left the impression that the notion itself is a merely subjective product evolved by the laws of association, and is therefore as accidental and capricious as the *feelings* of an individual might happen to be. This has opened the way for, and given sanction to the views adopted by J. S. Mill and others, which overlook the objective reality of the ground of this feeling in the actual resemblances of nature and the permanent laws and powers of which these are the indications. Against all such views, and the tendency to adopt them, or even to sanction them by incautious language, the protest of Leibnitz against Locke, quoted above, is most timely: "The generality of universals consists in the mutual resemblance of individual things, and *this resemblance is a reality.*"

§ 409. Hamilton (Lectures on Metaphysics, Lec. 35) criticises Brown severely for misrepresenting the nominalists, in asserting that they overlook the fact that resemblance in individual objects is the ground of applying to them universal names. Brown may have overlooked these concessions, but he certainly did not misstate the chief objections to their theory. Hamilton then labors earnestly to show that discerned or predicated

Sir William Hamilton.

resemblance is individual, and not general; inasmuch as if likeness exists between a pair of objects, it must be an individual relation of likeness. In this he is clearly in the wrong. My *act* in discerning the likeness of two objects, as two eggs, is an individual act, but the relation discerned, the likeness, is certainly common to, i. e., equally affirmable of, the two eggs, and so far forth a *general conception or notion*. He then adds that we are unfortunate in that the English language is not provided, like the German, with terms appropriate to universal and individual objects. We have no terms like *Begriff* and *Anschauung*. But what the *Begriff* signifies, whether a name or a *concept*, he does not explain. He only asserts that the peculiarity of the *Begriff* consists in its being the product of the faculty of *comparison*, but does not explain what comparison evolves as its effect or product. He overlooks also the fact that the act of comparison is involved in reasoning and perception, as well as in the judgment that produces the concept or notion.

In his logic, however, and in all the treatment which he gives to the concept, he proceeds upon the hypothesis of Conceptualism, in the manner in which Reid qualifies and explains it. Indeed, it would seem that his peculiar doctrine of the syllogism and deductive reasoning can have no meaning on the theory of Nominalism. And yet he would almost have us believe that he is a Nominalist, and "that the opposing parties are really at one." Hamilton refers with approbation (*Logic*, Lec. 10) to the distinction between symbolical and intuitive knowledge which was made by Leibnitz, and which in his view "has superseded in Germany the whole controversy of Nominalism and Conceptualism, which, in consequence of the non-establishment of this distinction, * * * has idly agitated the psychology of this country and of France." But what this distinction is, he does not explain so far as to say whether the symbol is a mere name or a universal notion. (Cf. Archbp. W. Thomson, *Outlines of the Necessary Laws of Thought*, §§ 23, 47, 48. H. L. Mansel, *Proleg. Log.* chap. i.)

§ 410. John Stuart Mill, in his *Logic*, B. i. c. 2, and his *Examination of Sir William Hamilton's Philosophy*, chap. 17, earnestly advocates Nominalism. Names are names of things, but while they *denote* things, they also *connote* the attributes of things. Thus horse (or chalk) denotes every individual horse (or piece of chalk), but it at the same time notes or marks, i. e., connotes all that is peculiar to every horse, or to the class horse.

Instead of the term *concept*, or *general abstract notion*, Mill would use *class name*. The mind, whenever it uses the class name intelligently, must have some individual object before it, either *perceived or remembered*. It need not, however, direct its attention to every part of this individual object. It need think of, i. e., attend only to, those parts which the name connotes. It need not think of all of these even, but only of those which it has occasion to use at the moment for its immediate purposes. Now it is by association that we connect with a class certain parts of an object, so that when we think of the name, though the whole object is perceived or imagined, only those parts of the object are attended to which the name connotes. It is by association that these parts are thus connected with one another in the mind and with the class name which suggests them when the name is first presented to the mind; or which they suggest when the individual object is first perceived, and these parts are attended to.

This theory is explained at great length by its able and ingenious defender. In its substantial features it is identical with the theory of Hume and of Hobbes. It is defective in the following particulars. It does not explain the import of *parts* of things, nor the relation of the parts to the wholes to which they belong, or in which they inhere. Attributes, properties, and relations, are what are intended by the word "parts," but what attributes are, and how they can be affirmed or predicated of a thing, is either assumed to be self-evident, and therefore to need no explanation, or else the relation of attributes to beings is assumed to be fully expressed by that of parts to a whole. Next, the author overlooks that, when we attend to the "connoted" parts of a single horse, it is not to them as parts of the individual, but as *resembling* similar parts in all the horses "denoted." Except as they are like these parts of the objects of the class, and so serve to represent them, the thought of them would be of no service whatever; the mind would rest in the individual, and never move a step beyond; neither the thought nor the name would give us a class object, or a class name. Next, association is not predication. The mental connection by which when I think of one object I must think of another, is purely subjective; it is a movement or tendency which pertains to the mind only. The relation thought of, of resembling attributes to other attributes, or of these attributes to beings, is purely objective. It is as Leibnitz observes, a reality. When we go a step further, and take in the relation of these resembling attributes to the laws and causes which they indicate, we strike upon a deeper vein. Thus, the powers and other obvious qualities connoted by the word horse, indicate an interior structure fitted for nourishment, strength, spirit, instincts, &c. But the possibility of such relations is entirely unprovided for by Mill's theory of the concept. Mr. Mill objects to the doctrine of Hamilton, that we classify and reason by the medium of concepts. He would prefer to say, that we classify and reason by the medium of names. But he concedes that it is what the names *connote*, that gives them all their meaning and application, and that we attend only to those parts of the object, when we use the name of the object or think the object under the name: Hamilton means no more. If Mill supposes him to teach or to authorise the inference that we form an individual percept or image of the import of the concept by the medium of which we think of an individual thing, he is mistaken as to his meaning. His own language might also expose him to the charge of teaching that we think of individual objects by the *medium* of the parts which their individual names *connote*. The language, that we think by means of a concept, is

class name, or the connotation of a name, is liable to be misconceived, and Mill has done well to guard against this misconception, but he has unjustly charged upon Hamilton a doctrine which he does not hold.

§ 411. Herbert Spencer (*Principles of Psychology*, part I. chaps. 8 and 9) agrees with Mill and Hume in their leading principles, as already explained.

Herbert Spencer. He recognises and earnestly insists upon the fact, that we perceive similarity between things and between the relations of things; also, that the perception of such relations is not only essential to reasoning and classification, but even to an act of sense-perception. He urges, that we are not properly said to perceive an object, unless we also generalise and reason in regard to it.

As to whether we generalise and reason by means of the concept, and what is the nature of the concept or of the name when thus employed, he raises no questions, and therefore answers none. How we connect these parts, seen to be similar and similarly related, into wholes, and what the wholes are, he does not explain any further than to refer us to the law of association, by which one suggests another and the name.

We scarcely need repeat the remark, that the law of association only accounts for the process by which these objects come into the mind, but does not at all explain what the mind believes in regard to them. These so-called objects or parts which are recognised as like and recalled to the mind, are believed to be attributes. But what attributes are, and what are their relations to their fellow-attributes and to the things to which they belong, and what is the nature of the object of our thought when we class objects by means of them, and what its relation to the objects which it denotes: none of these questions are discussed; they are not even raised by Mr. Spencer.

§ 412. Of the modern German philosophers, Kant should be named first, not only in the relation of time, but on account of the influence which he has exerted upon all subsequent philosophy. Kant distinguished very sharply between individual and general objects of knowledge, and in the spirit of these aims he introduced many technical terms which are not only still retained in the German systems, but have been adopted by English thinkers. Kant's terminology is not only a permanent monument of his own activity, but it has served to fix some very important distinctions in the minds of speculative men. Kant says very little directly concerning the nature of the concept as the product and object of the mind's activity, or concerning its relation to the objects of sense. Indirectly, however, he treats this topic very fully. First of all, the concept, *der Begriff*, is the product and object of the understanding—as the percept *die Vorstellung—der Sinnliche Gegenstand*, is the product and object of the action of sense. The image *das Bild*, *das Schema*, is the work of the faculty, the reproductive and productive. The percept is individual and so is the image-proper. The concept is general and definite. The *Schema* is intermediate between the two, being indefinite and movable, and in a certain sense general (cf. § 236). The percept, the image, and the *Schema* are all directly apprehended by the mind. The concept is mediately apprehended and mediately applied, requiring, to be used, that it should be concrete in an individual object, and that an individual should be understood by means of itself. Knowledge by concepts is preeminently mediate knowledge.

In the concept, *the matter* is distinguished from *the form*. The matter is furnished by the senses, *the form* is furnished by the understanding. Before the two are brought together, the sense-matter must become a percept in the forms of space and time. The matter of the orange is furnished by all the senses. This matter becomes the percept orange by taking certain relations to space. It becomes a concept by being viewed by the understanding as a being with attributes; which are distinguished from each other, and yet are common to many individuals, involving the recognition of diversity, similarity, and production or causation. These and other such forms are given by the understanding itself; which, in acts of thought, as it were, covers over or invests the matter of the senses with each and all of them. It would seem from these doctrines, that Kant was eminently a conceptualist, inasmuch as he insists so much upon the concept as the medium of thought, and so often repeats the assertion that thought is knowledge by the medium of concepts. But he does not declare himself such. His treatises are all logical and metaphysical rather than psychological. Though a theory of the powers and processes of the soul is constantly implied by him, it is not presented in the psychological form. It would doubtless have been far better for German philosophy, and for all modern philosophy, if his method had been less metaphysical and more psychological. He followed the bad example of the Greek philosophers, and like them left to his disciples and successors a legacy of profitless subtleties and endless disputes in respect to the nature and meaning of Concept, Idea, Matter and Form; as well as of Sense, Understanding, and Reason. These terms have been too generally treated by the later schools, as *entities*, hypostasised like the *ideas* of Plato, the *forms* of Aristotle, and he *substantial forms* of the schoolmen.

§ 413. Fichte accepted literally the principle of Kant that the forms of the concept are the products of the understanding, and applied it with logical rigor to its appropriate consequences, viz.: that all the so-called forms of knowledge as contrasted with its matter, are furnished by the mind's own creative activity. The matter of all knowledge is a subjective experience of the soul, therefore we can only reach the objective world by

a thought process, i. e., by means of concepts, created or evolved according to the forms of the mind itself.

I. H. Fichte.

This assumption makes the use of the concept essential to the apprehension of the external world, *i. e.*, to sense-perception. This reverses the order of dependence which was assumed and supposed by both Nominalists and Conceptualists. These agree in making the real, *i. e.*, the material, produce and go before the name and the concept. Both agree in making the general follow and be dependent upon the individual, *i. e.*, the actual. But Fichte would make the individual dependent upon the concept, at least for its form. Upon this theory the whole question respecting the relation of the concept to the individual object becomes entirely changed. Individual objects are themselves individualised concepts. Real things are the creations of the mind. The concept itself becomes an entity, more potent than the *idea* of Plato or the *form* of Aristotle.

§ 414. This direction reached its terminus in the extreme opinion of Hegel, who makes the concept every thing and the individual nothing, who evolves the real world from the concept, to which he ascribes an infinitude of elements and a power of self-development, adequate to produce the boundless varieties of individual things. Should it be said that this is a misconception of his doctrine; that he treats only of the relation of concepts to one another, and of individuals only so far as they are conceived or turned into concepts, the result is the same, so far as our position is concerned; which is that he does not concern himself with the relation of the concept to the individual, nor with the nature of the concept as a product of the mind, nor as a representative of concrete being, but treats it as an all-sufficing and independent entity.

§ 415. Herbart and the philosophers of his school are in as striking contrast with the other German schools in their views of the concept as in their views of many other points. Herbart sharply distinguishes the notion viewed psychologically, from the notion as regarded logically. Psychologically viewed, the notion is a growth resulting necessarily from the repetition of many homogeneous and heterogeneous sense-perceptions. The homogeneous are those which naturally blend together, as similar colors, tastes, sounds. These by repetition enforce one another so as to increase the capacity of the soul for another exercise of the kind. The heterogeneous are different colors, sounds, etc., preeminently the objects of one sense as related to those of another, as a color to a sound, and of either to a sight. These combine with one another into a series under a psychical law of tension, which Herbart claims pertains to the energy of the soul in passing from one state to another, and which impels the one to recall the other. A homogeneous impression or a heterogeneous combination, when often enough repeated, becomes a definite concept, either of a single attribute, as of yellow, round, etc., or of a combination of attributes, as those parts or attributes which make up the contents or essence of the orange. As to the relation of the concept to things or material objects, the views of Herbart do not differ from those of Mill as already explained. The mind affirms those parts or elements which have become prominent in the way explained, of their background of accidental and changeable accompaniments. This background is the individual thing of which they are affirmed, as the accidental peculiarities or relations of color, surface and form, belonging to a single orange. To affirm the one of the other is constantly to connect the one with the other, under Herbart's law or theory of Association. In other words, what is ordinarily called the discernment of similarity in the case of single attributes, Herbart resolves into the subjective blending or enforcement of homogeneous mental states. What is ordinarily affirmed to be the predication of a concept as belonging to a thing, he would explain by the necessary suggestion of one part of a series of mental impressions by another, according to the laws of the mind's own experience.

A concept is only a partial percept, but stronger in some parts than in others, the stronger parts being connected with the weaker by the laws of suggestion.

The concept as a logical entity is treated as a fixed and definite whole, made up of its fixed constituents, or essence. Psychologically viewed, it is not so much a finished whole, a completed product, as it is a tendency of the mind toward such a product. The mind is always forming concepts of individual objects, but the process in respect to none of them is necessarily complete. For this reason we can never contemplate a concept as an object of the mind's apprehension, separately from the individuals in which it is realized. We require some individual example of a man, orange, house, etc., to suggest with sufficient distinctness and force, the parts which the concept represents. The very force with which these are suggested tends to keep out from the attention the weaker parts which are accidental and individual, except in very extraordinary and exceptional cases. In this way it is that the difficulties urged by Berkeley and Hume are set aside, and the objections of the Nominalists to the possibility of concepts are answered. (Cf. Herbart, *Psychologie als Wissenschaft*, §§ 120, 121. Drobisch, *Emp. Psych.*, §§ 15, 16, 17. Waitz, *Lehrb. d. Psych.*, § 20. Volkmann, *Grundriss der Psych.*, § 96.)

With Schleiermacher, and Schelling in his later years, a better direction was developed in German philosophy, which has been followed with great zeal by I. H. Fichte, A. Trendelenburg, H. Lotze, H. Ritter, H. Ulrich, F. Überweg, and many others. They all labor at the same problem which vexed the ancient schools—the nature of the concept and its relations to the real object; or, as expressed in other language, the relations of Thought to Being.

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CHAPTER IV.

THE NATURE OF THE CONCEPT.—CONCLUSIONS FROM THE HISTORY OF THEORIES.

THE brief review which we have taken of the various theories of the concept will enable us to see more clearly and to define more exactly its real nature as a mental product, and its relations to the objects from which it is formed, and to which it is applied. Every false or defective theory is founded upon some truth. What that truth is, it is always important to discover, even when by exaggeration it is distorted into positive error, or, by omission there is defect and mutilation. The consideration of such defective or exaggerated theories is most useful in enabling us to ascertain the truth in all its relations, and thus to develop it completely, as well as to distinguish it from errors of excess or defect. Indeed, it is scarcely possible that a complete and satisfactory exposition of the nature and relations of the concept should be either furnished or appreciated without a critical review of the various theories which have been devised and defended in respect to them. It is scarcely necessary to observe, that the variety of these theories, and the pertinacity with which they have been defended, indicate that the subject is more than usually difficult of mastery, and that a satisfactory exposition of it must require a subtle and copious analysis. In the light of our historical sketch, we observe :

The concept an object and not an act. § 416. 1. The concept, as a mental object or product, is to be distinguished from the mental act by which it is originally produced or recalled. The act is necessarily an individual act. The concept or product may be general. In other words, it is possible that the mind should perform individual acts of generalization.

There is no logical inconsistency between the individualization which must pertain to the act and the generalization which may pertain to the product. When we form—i. e., distinguish—for the first time, or reproduce for the thousandth time, the simple concept *yellow*, or the complex concept *orange*, we distinguish the act from the object. We know that the act is individual, but this does not imply or involve that the object should be individual also (cf. Reid, *Essays*, v., c. vi. § 1).

Implies the distinction of beings and attributes. § 417. 2. The concept, as a mental product and a mental object, implies that the distinction of individual beings and their attributes is accepted as real, and therefore admitted as possible. The first step in forming the simplest concept, or in finding the elements out of which it is formed, is the act of making this distinction.

That this distinction is made and can be thought of by the mind, is asserted or conceded even by the extremest nominalists. Thus Hobbes says : "One universal name is imposed on many things for their similitude in some *quality* or *accident*." That is, the mind must distin

gush the qualities or accidents from things, in order to discern likenesses between them Berkeley does indeed say for himself, "I deny that I can abstract one from another, or conceive separately, those qualities which it is impossible should exist so separated." But in another passage he concedes, "A man may consider a figure merely as triangular, without attending to the particular qualities of the angles or relations of the sides. So far he may abstract." Mill is very full and decided in recognizing the distinction of things and their attributes as the foundation of the universal name (*Logic*, B. i. c. ii. §§ 4 and 5; *Review of Hamilton*, c. xvii.). We adduce the testimony of these writers, not because we accept their authority as decisive, but because their theory of the concept would tempt them to overlook or deny this distinction if it were possible. If they recognize it, there must be decisive reasons why they should, and these reasons are found in its necessary truth.

The testimony of consciousness, observation, and language upon this point is decisive. All men make this distinction, all men accept it, all men express it in the language which they use and understand. We cannot discern likenesses or unlikenesses in any parts or attributes, without distinguishing them from the objects themselves. But in separating or distinguishing them, we affirm that they belong to the objects. In what sense they *belong* or pertain to them, we need not ask. To *what* they belong, we need not here discuss. What remains after all the attributes are removed, or how it is possible that the attribute should be distinguished from the being from which it cannot be separated, we do not here inquire. The *nature* of the distinction of, and the *connection* between beings and their attributes, will be discussed in its place. It is enough for us to urge that it is real, and is universally made as the condition of the formation and the ground of the reality of concepts.

It is a related object.

§ 418. 3. The attribute is always known or apprehended as related to a thing or being. It is always held by the mind as attributable to or predicable of some being or thing. As an object of thought, it is a related entity or object, or an object in relation. Its import, or what is thought of by the mind, is not the object as such, but the object as related, or the object together with its relation.

We rest, at this stage of our analysis, to inquire, whether it is possible for the mind to conceive or think of a related object or of an object as related. The question is not whether the mind can contemplate the relation as such without the object, but whether, when the object is before the mind, another element can be added, viz., its relation. To select the simplest example: The mind knows the percept *red*; it knows it as the attribute of some being, viz., as the attribute *red*.

It would seem that there ought to be no question of the truth of this assertion, if the definition given of knowledge is correct, that it is the apprehension of entities in their relations. Whatever the mind can know, it can apprehend or think of. If it can know a related object, it can think of such an object.

Involves the recognition of similarity.

§ 419. 4. The attribute, which, as we have seen, necessarily includes the two relations of being separated from and connected with a being, is next viewed in the relation of similarity to other individual attributes, constituted and known like itself. The individual *red* is compared with other individual *reds*, and there is added to its import its likeness to them.

It is often said (cf. Mill, *Logic*, B. i. c. i.), that we might affirm the individual attribute of an individual object, as *white* of an egg or of chalk, without discerning a similar attribute

in any other object. That this is possible, is true; but it is also possible to go further, and to discern its likeness to other individual attributes. This is also usually done, whenever an attribute is expressed in language. The similar is *conceived* as the same (cf. § 388). But when the *similar* is thus recognized as *the same*, the additional relation of similarity is observed by the mind and represented by the term. The mind adds this third relation to the two others already considered, and the three are included in what the mind thinks or knows in the meaning or signification of the word.

Can be used for naming.

§ 420. 5. The attribute thus formed, having a common application to all similar beings, may be used to designate both like attributes and like beings—i. e., it may be used for the purposes of naming. The function of naming does not consist in affixing an oral or written symbol, an articulate sound, or a written character. This is an accidental circumstance, a mere appendage for convenience. The mental function or import of the name is its use in recognition or description.

The recognition may be of an object *as similar* or *as identical*. Again, we recognize objects as attributes or as beings. But so far as we do this by attributes proper, we employ single attributes or a combination of the same. Thus we may use *red* as an attribute, or *red* as a noun—the *red* or the *reds*; ordinarily, however, we use many attributes combined, as in the concept, the *red currant*. When we describe, we simply cause others to recognize the objects described, and by methods similar to those which we use for ourselves.

All that we need here to notice is, that, when the concept is used to denote objects, an additional relation is taken into its meaning, and this relation is apprehended by the mind. This *denoting* import of the concept enlarges its meaning by another relation.

It is a classifying agent.

§ 421. 6. The use of the concept in a system of classification enlarges its meaning still further. The capacity of the concept to be a classifier, arises from two circumstances: the fact that the attribute which is its germ, is common to more or fewer individual beings, and the fact that these attributes are very unequally distributed. Whenever it happens that one attribute, as *red*, belongs to more beings than another attribute, as *sour*; then the *red* may denote the larger class—i. e., the *genus*; and the *sour*, the smaller or subordinate class—i. e., the *species*. *Sour*, in such a case, may be the *differentia* of the species—the *sour-reds*. If *oval* is universally present with the species *sour-reds*, it would be a *property*; if *hirsute* were sometimes present and sometimes absent, it would be an *accident* of the same species. The application of any attribute in all or any of these class-relations, obviously gives an addition to its import. When a concept is used to classify, another relation is thereby taken up into its meaning, and its meaning is thereby so much enlarged.

That the intellectual process of classification is subsequent to that which underlies the process of naming—i. e., the act of recognition or description—is evident from a moment's thought. Both involve what may be called *generalization*—i. e., the use of the concept as general or as common to more or fewer individuals. One only is *generification*—that is, the arrangement of these individuals into higher and lower classes. The second only recognizes

the fact that these concepts are unequally distributed, some belonging to more and others to fewer individuals, and that they therefore are a means by which these may be classed as *genera* and *species*. The process and the product in the second case, both imply and are built upon the process and product in the first. In the first, we bring the individual under the general, by the direct act of forming the general from the individual in the way described. We know the individual under this concept or general name. In the second, we perform the reflex act of taking the general to divide all the individuals to which it belongs into their classes as higher or lower. The relation thereby established in the concept itself is both accidental and variable, according to the use to which it is put in classification. The same concept may be *generic*, *specific*, *differential*, *proprie*, or *accidental*, according to the material to which, and the use in which it is applied.

It is applied to an object on the ground of its import.

§ 422. 7. Whenever the mind uses a general term intelligently, it must understand or conceive the import which belongs to it in some or all of the particulars which we have enumerated. We do not intend that the mind consciously distinguishes and dwells upon each of these relations, but that, in forming and applying such terms, it must have recognized and thought of them all. The question in dispute between the different parties is, what object the mind thinks of or has before itself when it uses general terms. Our previous analysis has, we think, established that it thinks of all these thought-relations, and that they all enter into the distinctive import or meaning of *the concept as such*. If this is what the conceptualist contends for when he asserts that the mind must think, form, and have a concept of these generalized attributes, as often as it employs a general term, he is so far in the right. If the nominalist contends that the concept is only a general name—*i. e.*, a name which the mind applies to many objects—he is manifestly in the wrong. What the mind considers, is not the name, but the *meaning* or *import* of the name.

It is the name as applicable—that is, as for some reason or other proper to be applied. It is the name as general—that is, the name with an import. If it be granted that not a single element of this import could be discerned without the aid of the name—*i. e.*, without the instrumentality of language—still it is not the name as such, but the name as enabling us to conceive of the relation, that renders the aid which we seek for.

The import is exemplified by individuals.

§ 423. 8. The mind cannot conceive or acquire knowledge of the import of any concept, except by means of some individual example of the qualities or relations which it includes. We cannot know what single sensible attributes signify, as *red*, *sweet*, *smooth*, etc., without the actual experience of the sensation which each occasions, or of one that is analogous. So is it with the concepts of simple acts and states of the soul, as to *perceive*, to *imagine*, to *love*, to *choose*. The same is true of the concepts that are clearly complex, as *house*, *tent*, *knife*, *tree*, *horse*, *meadow*, *mountain*, *valley*, *township*, *legislature*, *authority*, *wealth*, *value*, *rent*, *wages*, *feudalism*, *civilization*. Of all these concepts, the elements must first have been made intelligible to the mind by their application—*i. e.*, by being observed,

experienced, or thought, in some individual being or agent. As we enumerate the constituents that make up the content of these concepts, and ask ourselves or others what is the meaning of each, we must employ some individual thing or act in order to explain our meaning to ourselves or to others. If we cannot reach the individual, we must do what is next best—we must refer to some being or act which is as nearly like it as possible. This is as true of the so-called relations as it is of qualities. *Equality, identity, height, depth*, etc., can only be understood by their being discerned in some individual thing or object—material or spiritual as the case may be.

But how is it when the meaning of the concept has been already acquired, both in its separate elements, and as united into a complex whole? Do we then need to go back to some concrete instance, in order to recall the import of the concept, or of the term by which it is named? We reply, that depends upon the use to which the knowledge is to be applied. If the import is not recalled, so far at least as we have occasion to know it, then we must go back to some being or thing in which it is exemplified. We cannot know a quality or qualities, a relation or relations, except as exemplified in some individual being or thing, for the plain reason that these have no signification except as belonging to beings or things. We cannot know what *red* is, except by the inspection of something red; what *imagining* or *remembering* are, except as an individual spirit imagines or remembers; what *equality, identity, height*, or *depth* are, except as some object is known as equal to another or identical with itself, or as high or low as compared with another.

§ 424. 9. Every concept is capable of being referred to an individual thing or *image*, and every individual or image can be *thought* into a concept.

This proposition reconciles the strife between the nominalist and the conceptualist. The nominalist asserts that the only ideas which we can frame or mental objects which we can think of, are individual. Bishop Berkeley insists: "The idea of man that I frame to myself must be either of a white, or a black or a tawny, a straight or a crooked, a tall, or a low or a middle-sized man;" plainly implying that we can form no other thought of man, and can by no means go beyond such an idea of an individual.

The conceptualist, in insisting that the concept must ignore and neglect the individual and his characteristics, often entirely overlooks the dependence of the concept upon the image or individual thing as the originator or the condition of its materials, and the explainer of its import. Locke says, in effect, "the general idea of a triangle" "must be neither oblique, nor rectangle, neither equilateral, equicrural, nor scalenon, but all and none of these at once." "In effect it is . . . an idea in which some parts of several different and inconsistent ideas are put together." It is plain that neither of these writers fully appreciates the relation of the individual to the concept, or the relation of the concept to the individual. Berkeley does indeed say, "An idea, which, considered in itself, is particular, becomes general by being made to represent or stand for all other

particular ideas of the same sort." But how the individual can *represent* particular ideas, he does not explain, and seems never to have considered.

This thought brings the subject to a distinct issue, in the questions, 'How can one individual represent other individuals? or, How can the individual explain and illustrate the general? or, How can the image be the occasion of the concept? A concept is general, an image is individual, how can you think the one into the other?' The sides of every individual triangle must have a definite length, and the angles a definite measurement and relation. Every individual man has in like manner a definite height, form, color, etc. We think these into concepts, not by overlooking the individual relations of each, but by considering their likeness to other attributes in other respects—the sides and angles, not in their individual relations, but simply as sides and angles—*i. e.*, as bounding a figure and as being contained within two lines. We do not properly leave out of view what is individual, as the color of the man, his size, height, etc. In one sense we keep these in view, in order to compare their likeness with other colors, etc. We do not so much leave any thing out of view, as we add the new relations of likeness which the formation of the concept involves. When we form the concept by the image, or bring back the concept to the image, we simply view the image in certain additional relations. An object viewed without thought-relations, is an *image*. An image with these relations added, becomes a *concept*. The knowledge which we have of the one is limited and partial; the knowledge of the other is fuller and more complete. It is true that, when we *think* the image, we give our attention to fewer elements; but we are not obliged to overlook or omit these when we regard others. Least of all do we introduce into the concept elements that are *inconsistent* or *incompatible*, and make—*i. e.*, *image*—a triangle which is neither rectangular, acute, or obtuse, as Locke asserts is necessary and as Berkeley objects is impossible.

The concept, in its very nature, is relative to the individual.

The fact is, that the concept is, by its nature, a related object—*i. e.*, a thought related to a being or thing. It requires the image to make it intelligible or complete. It supposes an image to which it belongs. It is all the while seeking the individual from which it was formed, and to which it should be applied.

The intimacy of its relation to and its dependence upon the image is implied by the constant necessity of imaging our concepts, or of translating the same into facts of sense or consciousness. Would we be sure of the import of a concept, we must carry it or its elements back to their concrete original, or to the picture of such an original which the phantasy can recall or create. Would we be sure of its truth or validity, we must test our theory or conjecture, by going back in experience or imagination to the original things, acts, or events by which the qualities or relations concerned can be validated.

Different images illustrate the same concept.

It is curious and instructive to notice here, that every man images the concepts which he employs or hears of, by examples that are peculiar to himself, and which are derived from his individual experience or observation. If his experience or education is marked by very striking peculiarities, the concrete

examples suggested by concepts and general names will be as peculiar. An Esquimaux, a Chinese, and a European, would picture very different objects to the imagination, on hearing or reading the words *state, legislation, wealth, money, wages, civilization, fashion*; and even the more concrete terms, *house, city, ship, oar, sail, knife, feast, procession, township, meadow*. Two inhabitants of the same country, and sharing in substantially the same experience, interpret the import of the commonest and most familiar terms by very different instances or examples. And yet their concepts are substantially the same, inasmuch as their more important and essential attributes remain unchanged, however greatly their individual exemplifications may differ.

This circumstance explains how there may be a community of thoughts, with a very diverse experience. The nature of things and the nature of man remains unchanged. The same powers, laws, and ends are perpetually reappearing, the same principles are continually illustrated, under forms the most unlike.

If the concepts which we ourselves employ or which others present to our minds, are highly abstract or very complex in their elements, the chances are greatly increased that an appropriate concrete individual object will not be readily suggested, because it is so many removes from the attenuated abstraction, or because, by reason of the complexness of the concept, some one element fails of being distinctly represented or clearly discerned. Hence, in those sciences which abound in terms and concepts of this description—concepts which do not readily suggest individual instances—illustrations should frequently be introduced, in order to keep both the meaning of the concepts and the evidence for their truth fully and freshly before the mind. Otherwise, the most gifted and best-trained student will fail to follow the discussion with complete intelligence and hearty assent. There is danger that many will be satisfied with a confused interpretation or a partial conviction. It may even happen that, through lack of the concrete and individual to support the abstract, the mind will take its revenge by turning the abstractions themselves into realities; will personify them into concrete beings, and invest them with the attributes and functions of powers or things in nature.

Such words as *the absolute, the infinite, the true, the beautiful, the good, the just, the equal*.—even such names as *heat, life, light, etc.*, etc., are often used as though they were individual and concrete entities, instead of requiring entities to realize and explain them. Through frequent repetition as sounds, they seem to be intelligible as things, and we presume that our mastery over their meaning is complete, when we only very imperfectly comprehend their import, and are able very inadequately to explain or apply them.

Hobbes remarks very pertinently (*Leviathan*, part I. ch. 4), "A man that seeketh precise truth hath need to remember what every name he uses stands for, and to place it accordingly; or else he will find himself entangled in words as birds in lime-twigs; the more he struggles, the more belimed." "For the errors of definitions multiply themselves, according as the reckoning proceeds; and lead men into absurdities which at last they see, but cannot avoid, without reckoning anew from the beginning, in which lies the foundation of their errors. From whence it happens, that they which trust to books, do as they that cast up many little sums into a greater, without considering whether these little sums were rightly cast up or not, and at last, finding the error visible, and not mistrusting their first ground, know not which way to clear themselves; but spend time in fluttering over their books, as birds that entering by the chimney, and finding themselves inclosed in a chamber, flutter at the false light of a glass window, for want of wit to consider which way they came in." "As men abound in copiousness of language, so they become more wise or more mad than ordinary. Nor is it possible without letters to become excellently wise or excellently foolish."

The concept is aided by the name. The necessity of language.

§ 425. 10. When the concept is furnished with a name, the mind is gradually accustomed to interpose the verbal sign between the concepts and the individual beings and events which exemplify and illustrate them. In this way the

processes of the mind are greatly facilitated, and the attainments of the mind are enlarged and rendered more permanent.

How it is that the mind is qualified, prompted, and taught to use language, we need not here inquire. We have only to recognize the service which the use of language renders to our thinking in general, and in the formation and use of concepts in particular. We scarcely need remark, that the name may be either a spoken or written word. It may even be a descriptive or arbitrary gesture or sign. It may be the name of a being, an act, an attribute, or a relation, or of some or all combined in a term or proposition. The reasons why language aids our thinking are the following:

(a.) The name is both a sensuous and an individual object. It presents to our sense-perceptions a definite object, which we can readily evoke, distinctly apprehend, and easily and unmistakably repeat. What it represents, is indeed abstract and general, but the name itself is an individual object of sense-perception.

The name is sensuous and individual.

Were it possible for the mind to gain and hold a concept not connected with a sense-object, it would not rest content, but would cast about in order to find some such concrete object to which to attach it. If a sensuous word has been associated with the abstract concept, such an object at once presents itself far more quickly, perhaps, than any of the many things or images by which the abstract might be imaged.

The word addresses a single sense, the ear or the eye singly, or the two combined. In either case it is ready to appear when called for. The winged word flies to our aid, and the ghostly product of thought is at once embodied before the senses.

(b.) The word is the sign, not of the whole of the individual thing or being which might image or exemplify the concept, but of a portion of its attributes or relations. In consequence, words present a greater variety and refinement of objects than exist in the world of nature. The words *red*, *fruit*, *acid-fruit*, *currant*, *cherry-currant*, may all be imaged or exemplified by the same sense-object, viz., the fruit before us. *Red* stands for a single one of its properties; *fruit*, for several; *red fruit*, for yet others; *currant*, for more; and *cherry-currant*, for even more. So the words *company*, *an organized company*, and a *legislature*, may all be illustrated by the same body of individuals which the senses discern, while each of the words represents more or fewer of their attributes or relations.

It is a sign of a part of the relations of the individual.

These attributes are present in a vast variety of single objects, themselves most unlike in every other respect. These attributes and relations are the special objects of the mind's consideration and pursuit in the exercise of its higher functions. The gain is immense which is secured when each can be attached to its single sensuous name, and can thus be distinctly pictured to the imagination, recalled by the memory, and separated from all its accidental surroundings, leaving the mind undistracted by attendant circumstances. Each attribute is thus definitely fixed in the mind and retained as a permanent possession. It may, perhaps, have been discovered by very careful and earnest attention, or separated by the nicest and most pains-taking analysis, or evolved and suggested by another property as remote or obscure as itself; but if, as soon as it is evolved, it is enshrined in a word, sensuous, brief, easily mastered, recognized and recalled, this obscure and entangled property, which might have been

overlooked at a second view of the object which suggested it, cannot easily sink back again out of thought or remembrance.

To fix and represent every attribute by a word, is also necessary for the service of communication which language performs. Another mind could not be brought to direct its attention to the attribute and property which we with difficulty discern, unless the attribute were represented by a name. This, however, does not weaken, but rather confirms its service to thought, in rendering its acquisitions permanent and ready for use.

Names prepare for new distinctions and discoveries.

(c.) Names enable us to add to our stock of logically dependent concepts. One concept is dependent upon and grows out of another. To form one concept, prepares us to form another, and is often the essential condition of its existence.

The second is often entirely dependent upon the first by a logical and psychological connection. Unless the first is clearly discerned and firmly held, the second cannot possibly be reached. The name sets it distinctly and permanently before the mind, and enables us to make of it a stepping-stone to the next acquisition, which without the name would have been unattainable.

Names suggest only the relation which we require

(d.) Names aid most efficiently in rapid thinking, by sparing us the necessity of dwelling on the entire import of the word itself. Though the name usually represents a complex concept, and the concept to be understood must be illustrated by some concrete example, yet the mind may use names intelligently without pausing to apprehend more than a small portion of their meaning. In conversation or quick discourse, as well as in reading by the eye, only enough of this import is perceived to satisfy the present occasion—all else is omitted. Even whole sentences, when they are familiar, are received as the sign of a single concept or relation, viz.: that which the present occasion requires.

This can only happen when the language is familiar to the eye and the ear, so that, as the eye and the ear each catch enough to identify the word or phrase, the mind also catches enough of the import to satisfy the present occasion. Were not the words addressed to the senses, and capable of rapid formation and reception, they could not serve this rapid application. Without the assistance of names, such a partial apprehension of the import of so great a variety of generalized attributes would be impossible. It is true, the quick eye of the huntsman, the engineer, or the physiognomist, can read signs with a rapid and almost lightning glance, and thus without words apply the generalizations of previous observation. But their range of objects and relations is limited when compared with the generalizations to which language accustoms the mind. So wonderful is the power of words to facilitate the processes of thought, that names seem almost to become beings, and to attain an independent and separate existence of their own; and the world of words takes its place side by side with the world of things: cf. Leibnitz, *Med. de cog. ver. et ideis*; also Hamilton, *Logic*, Lec. 10; J. S. Mill, *Exam. of Ham.'s Phil.*, chap. xvii.; H. L. Mansel, *Prolog.*, chap. I.; Burke, *Essay on the Sublime and Beautiful*, part v.

Experience demonstrates the value of language to thought.

(e.) Experience teaches that, without the aid of names, the mind makes little progress in forming or applying its concepts. The use of language, and of spoken language even,

is found to be almost essential to successful thought. Without language, the discriminations of attributes are few, the generalizations are narrow and limited, the power to enter into and receive the thoughts of others is almost dormant.

Many have gone so far as to conclude that, without words—i. e., names—we cannot think at all. Experience with deaf-mutes, who have acquired little even of the language of signs, disproves this extreme conclusion. These show, by their actions, that they generalize—i. e., form concepts—to a limited extent. They classify and arrange observations, they analyze and compare attributes, they apply principles in deduction and infer them from data. But while they show that it is not impossible to think without names, they also prove most conclusively that, without such aid, it is impossible to think with much effect. As soon as they learn to form and use names by the mastery of signs and written language, their power of thought is greatly quickened, and their stock of concepts is rapidly increased. But the language of the eye alone, which is the only language at their command, is immeasurably below the language of the ear in the fineness and variety of its material, as well as in its capacity for ready assimilation and recall. Still, the surprising acquisitions made by deaf-mutes, in spite of all the disadvantages under which they suffer, are a signal proof that the mind is not restricted to any one kind of material out of which to form for itself a language; that words, in whatever form, are only the signs of thought, and are not essential to thought itself.

This explains the doctrine of the nominalist.

These facts all explain how and why the *nominalist* was led to adopt the opinion that there is nothing in the universe but beings and names, and that the only generals or universals conceivable are names.

The concept without the name is almost as though it were not. It has no effective existence. It can be retained and recalled and used only to a limited extent. The number of concepts that can be formed without words is small. The number that can be communicated ever by the language of signs is inconsiderable, and these are of little service in the higher developments and functions of the mind.

It proves also that the name requires a concept.

This very analysis of the relation of the name to the thing, however, proves as decisively that the name can be formed from or applied to the being or thing, only as it represents a concept, and that the concept furnishes all the import which the word can ever represent or possess.

If it should be conceded that not a single concept was ever formed without a name, it would still be true that the word could neither exist nor be applied to an individual thing except as a concept was also generalized into being. If the word is the body of which the concept is the soul, the concept may still be as essential to the existence of the name as the soul is to the conception or reality of the body. Except as representing the concept, the name is an irrational sound, an insignificant mark or series of characters. It cannot signify a thing, except as it stands for its generalized attributes and relations, and these are a concept.

The truth represented by realism.

§ 426. 11. The realist asserts for the concept a still higher import and use. The truth which is the basis of his theory is, that every real concept should suggest or express some one or more of the *essential properties* and *unchanging laws* of individual

beings. He is not content with the view of the nominalist, which makes the general term a mere class-name for the simple convenience of language, nor with the view of the conceptualist, who regards the concept as a chance-assemblage of attributes. He insists that the concept ought to signify and represent the most important of all descriptions of knowledge, the knowledge of that which is permanent and universal. This is the truth that has given currency and influence to the realistic theory, though this theory has often been expressed in extravagant and metaphorical language, and been defended by insufficient arguments.

All individual objects of nature have their essential elements. These exist under constant conditions, and are produced by permanent forces, according to fixed laws and ends. The constituents, conditions, causes, laws, and ends of individual objects are often called *their inner truth, their essential nature, their true meaning, their real and permanent being*.

The individual mass of earth or ore, the single crystal, leaf, herb, tree, fish, bird, reptile, quadruped, and man, have accidental relations of position, form, size, color, or taste; they exist here or there for a longer or shorter period of time, but these relations are of little or no importance for many of the higher

ends of knowledge and of practice. They are observed by one and another, they interest more or fewer persons, they differ in a greater variety of inferior and accidental features. *The kind, the class, the genus and species*, have certain common characteristics which are known to all, and which indicate many others which are also of wide and deep significance. These are everywhere present. They are constantly perpetuated by the reproduction of the individual, and they can never fail. Their place in the universe is never vacant, and their importance in that economy by which the designs of nature are constantly accomplished is always the same. It is to reach the knowledge of these *elements, causes, laws, and designs*, that concepts are formed, classes are arranged, and names are given. As we have seen already, many of the earliest classifications and concepts are rude and unsatisfactory for scientific purposes, because they are founded upon attributes that are superficial and narrow in their significance and indicate few or none of the permanent elements and laws of being. These are gradually outgrown and displaced by others which are discovered to suggest more comprehensive agencies and more pervading laws.

Accidental prop-
erties and rela-
tions.

On the other hand, there are certain classifications and concepts which, though formed very early, are never laid aside, because, though the attributes are obvious and even obtrusive, they coincide with the results of the nicest analysis and the most penetrating insight. Such are the concepts that are formed of the different species of animal and vegetable being, each one of which indicates and expresses many qualities and laws which science as yet has been unable adequately to discover and resolve.

Permanent clas-
sifications and
concepts.

No better illustration can be adduced of the differing import of different kinds of concepts and classes, than is furnished by the history of botany. Linnæus hit upon the convenient expedient of classing the different individual plants by the number of the stamens that appear in their flowers. The classes were subdivided into orders by the number of pistils. The device was convenient, because all plants have flowers, and the number of the stamens and pistils is in most cases con-

The classifica-
tions of Botany.

stant, and presents a ready means for their division and subdivision into classes. To a certain extent this division meant or signified something. The number of stamens and pistils, in some cases was found to indicate other common characteristics of some importance, and seemed to point to deeper qualities and laws. But this was by no means universally the case. The classes and orders that were founded upon the number of these organs, were concepts that interested no one, because they signified nothing in respect to the structure or the germination, the growth or the habits, the flower or the fruit, and it was abandoned for another system of classes and nomenclature, which was founded on indications of greater practical and scientific significance.

The name usually signifies a permanent and important thing.

The importance that is attached to the act of assigning an individual to a class, and the giving it a name, can only be explained by the underlying assumption not consciously developed or expressed by the great mass of men but still tenaciously adhered to, that if we can class and name an object, we are in the way of learning something more in regard to its nature and laws.

The child is in a measure satisfied to learn the name of an object; and when an unobserved feature of likeness with another is indicated, it seems to see in this a clue to some new discovery. Starting upon this quest, it forms and changes its concepts and classes, till it reaches those which in some degree answer to the principles and laws which scientific knowledge unfolds.

These permanent concepts the things sought by the realist.

The representation by our concepts of these permanent and scientific relations of individual things is what the realists of all ages and all schools have had in view, more or less distinctly indeed, when they contended that every *real concept* had a permanent and undying existence in nature; that to every *general notion* or universal, there was a real and permanent essence, of which every individual shared a portion; and that the participation of this essence made the individual to be what it is in its divinest, and most important elements.

This general truth has been expressed in a great variety of phrases, many of them poetic and figurative, the use of which in philosophy in their literal acceptance, has wrought no little error and confusion of thought. This poetic and over-statement has in its turn given rise to an injurious reaction, in the form of a corresponding external and superficial theory of the importance of concepts, classification, and naming.

The mistakes of the realists.

The mistakes of the realists have been twofold. They have, both in language and thought, confounded the subjective concept, which is a purely psychological product, with its objective correlate—the related elements which it represents or indicates; and have often called both by the same name, and invested them with the same properties. They have used a highly metaphoric terminology to express the nature of universals, and their relations to individual beings.

The *ideas* of Plato and the Platonists, present from eternity in the Divine mind; the *forms* of the Aristotelians, incapable of existing apart from matter, yet essential to every material thing and species; the *substantial* and *essential forms* of the schoolmen, as well as

their *universals ante rem* and a *parte rei*; the *forms* and *ideas* of Kant; the *notion* of Hegel, self-moving from the empty yet posited nothing, and self-developed by constant growth into all the fulness of the *id-æ*, with the power claimed for this notion to pass into the objective, giving the world of material being, and then to return to itself so as by self-conscious affirmation and distinction to blossom into spirit and thus complete the circle of absolute knowledge;—all these are examples of the exaggerations and personifications of realism in its endeavors to express a most important truth. This truth has already been explained. The concept, viewed as a subjective product of the mind's activity, consists of one or more logically compatible attributes. Any attribute can constitute or enter into a concept as thus conceived, and make up its essence—i. e., its nominal or logical essence; for the logical essence is nothing but its constituent attributes (§ 393). We can form as many concepts, each with its own essence, as the laws of arithmetical combination will allow, and assign each to as many places in a system. But when we take our concepts from or apply them to individual beings or things, we find that the concept has another meaning and importance. The question which then arises is, What does the concept signify of things, their powers, causes, laws, and ends? We are then obliged to consider, not the essence of the concept as a logical fiction, but its relation to the most important properties and laws of individual and actual beings as viewed in their essential or scientific relations.

We may concede that the conceptualist, and even the nominalist, are in the right when they explain the import and meaning of the concept and the name, so far as they are viewed as subjective creations of the mind, or so far as their office is concerned in defining and distinguishing groups of things, and yet contend that they are entirely wrong in overlooking what of deeper import they represent in the things which they arrange, and in failing to see that naming and classification look to something higher.

That they cannot wholly overlook these higher relations is clear from important passages in Locke and J. Stuart Mill. In a most important chapter of the *Essay* of Locke, in which he contends at great length for the wholly subjective character of the concept and its nominal essence, he observes, that there is also a real essence, viz., "that real constitution of any thing which is the foundation of all those properties that are combined in and are constantly found to coexist with the nominal essence; that particular constitution which every thing has within itself, without any relation to any thing without it." *Essay*, B. iii. ch. vi. § 6.

John Stuart Mill also writes in the vein of an ultra-nominalist:

"It is a fundamental principle in logic, that the power of framing classes is unlimited, as long as there is any (even the smallest) difference to found a distinction upon. . . . The number of possible classes, therefore, is boundless; and there are as many actual classes (either of real or imaginary things) as there are general names, positive and negative together."

But among these classes he recognizes important differences—as between the class animal or plant, or the class sulphur or phosphorus on the one hand, and the class white or red on the other—in that the things covered by the one differ only in certain particulars which may be numbered, "while others differ in more than can be numbered, more, even than we need ever expect to know." "White things, for example, are not distinguished by any common properties except whiteness; or, if they are, it is only by such as are in some way dependent upon or connected with, whiteness. But a hundred generations have not exhausted the common properties of animals or of plants, of sulphur or phosphorus; nor do we suppose them to be exhaustible, but proceed to new observations and experiments, in the full confidence of discovering new properties which were by no means implied in those we previously knew." "There is no impropriety in saying, that of these two classifications, the one answers to much more radical distinction in the things themselves, than the other does." "Now these classes, distinguished by unknown multitudes of properties, and not solely by a few determinate ones, are the only classes which, by the Aristotelian logicians, were considered as genera and species." *System of Logic*, etc., B. iii. c. vi. § 6.

The careful student and critic will see, that in these remarks, this ultra-nominalist asserts the whole truth which was at the basis of the Realistic theory. The only defect which is fairly chargeable upon him is, that he fails to ask and to answer the question, What is the reason why, in the one kind of classes, we believe that an *inexhaustible* number of properties mutually dependent are signified, while in the other no such properties are looked for? According to his philosophical principles, he would be able to give no other answer, than, that experience teaches us that we find this true of certain classes and not of others. But simple experience, if it would teach that some characteristics indicate in fact a greater number of accom-

panying properties, would certainly not authorise the confident inference that many more that are as yet *undiscovered*, i. e., as yet unexperienced, remain. While, then, Mill asserts the fact that justifies and explains a candid interpretation of Realism, he shows himself entirely incompetent to explain the fact which he concedes, or our belief in it. For this his philosophy is neither sufficiently profound nor liberal.

Are there per-
manent classes
and species in
nature?

This subject has, of late, assumed a very great interest and importance among naturalists, in connection with the question of the permanence of species in the natural and vegetable kingdoms. Certain naturalists contend that none of the so-called species are permanent, either in the plan of nature, or its actual divisions; that every one of them has been developed by evolution from previously existing types, which owed their form and apparent permanence to certain conditions or laws that were but temporary in their action and transitory in their results. In this way Darwin, (*Origin of Species*, etc.,) Huxley, and others, reason from certain varieties produced within species, that all species existing at present, have been themselves developed. Herbert Spencer, by a broader application of the same general assumption, makes every type of existence, both material and spiritual, to have been developed from lower forms, which are held in being till forms still higher and more exalted shall displace them. On the other hand, *Owen*, *Agassiz*, and *Dana* find that the classifications of science must assume a more permanent and firmer foundation for the species which they accept, in the action of permanent forces after the fixed types that are contemplated in the unchanging plan and the manifested thoughts of God. In this assumption they reach the scientific truth of the bold metaphors of Plato, who taught that by definition and division, we find in the temporary and phenomenal the eternal and real ideas which exist in unsoiled and unalloyed purity in the mind of the Deity alone. (Cf. *Agassiz*, *Essay on Classification*.)

The relation of
symbolic to in-
tuitive knowl-
edge.

§ 427. 12. The analysis which has been given of the nature of the concept and its relations to the individual object or image, explains more exactly the relation of what is called *symbolic*, *mediate*, or *logical* knowledge, to that which is *intuitive*, *immediate* and *experimental*.

We have already spoken of this distinction in a general way (§ 383). We return to it again, for the sake of greater exactness. Knowledge by concepts is symbolic, mediate and logical. Knowledge by direct apprehension, whether in connection with consciousness or perception, is called intuitive.

When I perceive a sense-object, as a man, a house, or tree, or am conscious of an individual state of spiritual activity, or discern with the mind's eye a mathematical figure, I know intuitively each of these objects. When I recognize either as belonging to a class, or give to either a name, I am said to know it by means of the concept or name; and these concepts or names are said to be media or symbols, which I employ in knowing. This distinction, as thus stated, originated with Leibnitz, and much has been made of it by later thinkers, as Kant and other German philosophers, as also by Hamilton, Mansel, and Morell among the English. The

passage has so great an historical importance that we transcribe it at length. Mill, in his examination of Hamilton's Philosophy contends that it relates to words as symbols, and not to symbolic concepts. A closer examination will show that both are included in the author's meaning. See above, § 425. 10. (d.)

Plerumque autem, præsertim in analysi longiore, non totam simul naturam rei intuemur, sed rerum loco signis utimur, quorum explicationem in presenti aliqua cogitatione compendii causa solemus præstare, scientes, aut credentes nos eam habere in potestate: ita cum chillogonum seu polygonum mille equalium laterum cogito, non semper naturam lateris, et æqualitatis, et millenarii (seu cubi a demario) considero, sed vocabulis istis (quorum sensus obscure saltem, atque imperfecte menti obverantur) in animo utor loco idearum, quas de his habeo, quoniam memini me significationem istorum vocabulorum habere explicationem autem nunc judicio necessariam non esse; qualem cogitationem cæcam, vel etiam symboliceam appellare soleo, qua et in Algebra et in Arithmetica utimur, imo fere ubique. Et certe cum notis valde compositis est, non possumus omnes ingredientes eam notiones simul cogitari: ubi tamen hoc licet, vel saltem in quantum licet, cognitionem voco *intuitivam*. Notionis distinctæ primitive non alia datur cognitio, quam intuitiva, ut compositarum plerumque cogitatio non nisi symbolica est.—*Med. de cog. ver. et ideis.*

The ground for this distinction has been furnished already in the position, that every concept supposes an individual concrete, either real or imaginary, in which it is exemplified.

Its ground already explained.

No person can receive the import of the concept except as he resorts to this concrete for interpretation and explanation. When I pronounce such words as *white*, *red*, *sweet*, *sour*, etc., I presuppose that the person to whom I address them has known by experience, i. e., by intuition, what they signify; that he has either seen these colors and tasted these tastes, or those which are sufficiently like them. If he has had no intuitive or analogous experience of them, my words convey to him no meaning. The same is true of all the so-called simple ideas of Locke, which are the constituent elements of all those which are complex.

When, again, I use the words *man*, *legislation*, and *civilization*, I suppose that the person whom I address has had at least some experience of the elementary conceptions which enter into these compounds, and in all probability has had intuition of some concrete example of the compound itself. By whatever beings or events within his experience he may interpret or image them to himself, the fact is unquestioned that he must refer to his own experience, to understand the import either of the elements or of the compounds, or of both. The same is true of the more recondite properties and relations—those beliefs and principles which are the subjects of metaphysical controversy and speculation. Neither word nor concept can convey any meaning to the man that does not find within his own experience a voucher for its validity and import.

Words valuable for definition and impression.

The chief objects for which words and concepts are used are defined and exact thought on the one hand, and information and impression on the other. In the one case, the mind is occupied with the more abstract and general relations of objects. In the other, those which are broader and more obvious are employed, often solely for the excitement and gratification of the emotions. In both cases, use must be made of the objects and images of individual experience. But in the first, the relations concerned are less dependent upon the individual images which happen to be suggested, because to convey or awaken general relations is the chief end. What are the individual examples by which each individual hearer or reader verifies or illustrates them, is of less importance, provided he understands what is said.

Advantage of
intuition above
description.

But even here intuition is far better than symbolic knowledge; rather should it be said, intuition *with thought* is far better than symbolic knowledge without intuition. The most careful definition of a *mountain*, the *ocean-surf*, a *cataract*, a *giraffe*, a *palm-tree*, may convey far less satisfactory and far less accurate impressions than the inspection of a moment might furnish, provided the inspection leads to thought—i. e., to the formation or verification of concepts. With the concrete before us, our concepts are more exact, because we see for ourselves. The concrete also furnishes the material for any new concepts which we ourselves may form directly from their objects. Merely logical inferences from thought-premises and definitions, cannot be trusted so confidently as when the fuller material of intuition and experience is before the mind. But what is more important than all, is the circumstance, that, when the knowledge is logical only, the concrete images and illustration that are suggested may mislead to important error, or even defeat the very impression which the words and reasonings are fitted to convey. While the teacher employs concepts and arguments which the original concrete fully authorize and enforce to his own mind, the hearer may interpret or verify them by others which are not exactly similar or pertinent, and which not only fail to illustrate and confirm what is asserted, but seem to contradict and overthrow it.

Words more in-
adequate in
mere descrip-
tion.

The defects of mere words and the images which they awaken in comparison with actual intuition are still more striking when the objects are described rather than defined, and for the purposes of vivid impression and excited feeling. One is forcibly impressed with these defects, when he reads a description of a scene in nature with which he is personally familiar; especially if he reads it with the scene actually before him. However graphic or complete the description may be, it is but a lifeless outline when compared with the fulness and vividness of the reality, or with the throng of images which are awakened in the memory.

The impressions received from words by one who has never witnessed the reality, are but as thin and pallid shadows, when contrasted with full and glowing intuitions. The most exact and affluent description of Niagara is a very different thing to one who has recently seen the cataract, or who reads with his eye open upon the scene, from what it can be, to one who has never seen its wonders. If a person has never seen any waterfall, it is still more impotent to instruct the mind.

Language oper-
ates largely by
suggestion.

These facts bring to light very distinctly the truth that language operates to a very great extent by suggesting the images and remembrances which have been gained by the experience and observation of each individual person. Besides the direct office of instructing the mind, it serves to awaken a multitude of kindred images and facts which are suggested to them.

All that we have seen, or heard, or experienced, may be recalled by the words of another, who is entirely unconscious of the power which he wields, and the work which he is performing. Words which to one are dead and meaningless are to another full of life and import. Words meant only in kindness may awaken images of sorrow and pain. The reader of poetry must have somewhat of a poet's power to receive and recreate. The student of philosophy must have something of a philosopher's reach and insight, to understand and judge what he reads.

Language often
very inadequate.

There is a large class of facts and truths, as well of scenes and events, to which language can do but scant justice. These are those to which the facts and events which we know and have experienced are only remotely analogous. Language is feeble to convey to the inhabitant of a plain or prairie, the impressions of mountain scenery; to the stranger to woods, the grandeur of an aboriginal forest; to one who has always lived inland, the glory and the beauty of the ocean. A savage cannot appreciate, by description, the attractions of civilization. The person who has not entered a cathedral, or seen some of the great works of art in painting and sculpture, can never by description, be made to appreciate these objects.

The symbolism
of the invisible
and the spiritual
world.

When the means of finding analogies are still more scanty, the communication by language is still less successful. How anxiously do we endeavor to anticipate what may be the scenes and objects to which another life may introduce us! But how feeble is our power to imagine them, because our stock of analogs is so scanty! We desire most earnestly that descriptions in language may convey to us the desired information. But language may be in itself to a large extent impossible, because the only images which language can suggest must of necessity be taken from the scenes of the present state of being.

But while the images taken from these sources may as images be wholly inadequate; the thought-relations which they convey may be entirely trustworthy. The most important of these are taken from spiritual being, and pertain to the thoughts and feelings in which spirits may be essentially alike, however widely removed may be the objects with which they are conversant, or the media through which they communicate with them. It is impossible for us to have images of a state of being in which the spirit may have investments and confront objects that are unlike those to which we are accustomed in our present condition. But if we believe it possible that the spirit shall retain its identity and its most important spiritual states and acts, then it is easy to see how in connection with and through images borrowed from the things and events of the present, unchanging thought-relations may be conceived and taught.

Can the infinite
be described by
or to the finite?

It is sometimes asserted that the Infinite Spirit can have no common relations with the finite, so that all our conceptions of the infinite must be finite and therefore inadequate and unworthy; and that, consequently, all attempts of language to convey knowledge from the higher to the lower must be forever impossible, because the media—i. e., the images and concepts—must both be finite. This is urged against the possibility of any communication from God through the forms of finite nature, or by the media of human speech. It may be granted that to the mind, in its studies of nature, the *images* suggested or excited in the mind and the language founded on such images are wholly inadequate to express the divine, because both are finite; it may be granted even that the concepts of spiritual relations must necessarily be interpreted and illustrated by images taken from finite objects, and so far there are essential defects in our imaginations concerning God: yet it may remain true that there are relations of similarity and analogy between the finite and the infinite spirit, which render it possible that the one should

be understood by the other, and that the language which describes the one to the other should convey actual truth.

The infinitude of God may not exclude personality, which itself establishes a likeness between man and God. Personality may involve similarity of knowledge in its higher and permanent relations. A common sympathy may arise from a similarity of emotional capacities, while similarity in the common capacity of a personal will may render possible a similar moral Goodness. These likenesses or analogies, may coexist with the greatest disparities in every other respect. The one being may be infinite and the Creator; the other may be finite and the created; and yet the one, by indications through his works and communications by his word, may make himself truly, if not perfectly known. The imagination of the finite may be inadequate to picture the infinite, while the thinking of the finite may apprehend the relations by which the infinite thinks, and therefore creates, and, in creating manifests himself to the created.

Man may be in the image of God.

CHAPTER V.

JUDGMENT, AND THE PROPOSITION.

From the consideration of the formation and the nature of the *concept*, i. e., of the process and the product, we proceed to its evolution and expansion; to *judgment* considered likewise as a process and a product. The two are often known by the same appellation, viz.: judgment. More frequently, however, the *product* is known by the expression of the same in language, i. e., as a proposition. This term again is usually restricted to a logical proposition, or a proposition as composed of *two concepts*, i. e., a logical subject and predicate. It will be found, however, that both judgment and the proposition are more extensively applied; that the psychological is the condition of the logical judgment; that judgment enters into all the processes of thought, and therefore deserves the most careful consideration.

§ 428. The processes already considered, and which are involved in forming and applying notions, are alike in this; they are all acts of *judgment*. The mind cannot think without judging. To think, is to judge. Even in forming or evolving its notions—that is, in providing itself with the materials for what are usually called acts of judgment—the mind must judge.

The concept formed by an act of judgment.

This assertion runs counter to the statements which we find in many books of logic, which teach that the mind first furnishes itself with notions or general terms by means of simple apprehension, and then proceeds to compare and discern whether they agree or disagree: This last act only is called an act of judgment, and this is expressed in language by the proposition.

How represented in many logical treatises.

This doctrine is true only of the logical judgment—that is, the judgment which supposes the mind to be in possession of notions already formed, the relations of which it discerns and expresses in language. It entirely overlooks and leaves out of view those judgments which are psychological, i. e., those acts by which we acquire the notions which we afterwards use. It is with these judgments that we have to do; it is of this class of acts, that we assert that they must be exercised even in forming our concepts. Cf. Reid, *Inq.*, c. ii. § 4; *Ess.* iv. a. 3

The truth of this assertion is evident from many considerations.

(1.) Proved by the analysis of the act (1.) It is evident from an analysis of the act itself. If we retrace the steps which we have taken in forming concepts, we find that we cannot know attributes, except as we affirm them of individual beings. An attribute without a being is inconceivable in thought and impossible in fact. We can neither think nor believe it to be, without a something to which it belongs. In the very act of analysis, by which we separate an element in order to compare it with others like itself, we must restore it to that from which it was abstracted. The instant we exalt these similars into a same which is common to every being, we judge this same to be true of them all.

Suppose we meet with a series of unknown and unnamed objects, each of which has some attribute or property, or attribute that is new and without a name: or suppose the attribute to be familiar and nameable, while the objects are unnamed. We think and say of each of these objects, it is yellow, red, or green; or, it is this and that. We in fact perform a process which can only be represented by some proposition, one element of which is affirmed of another: *e. g.*, *x* is yellow, red, or green; or if each is without a name, *x* [individual] is *y* [common]. The nearest and best expression of this act which we find in any form of language is the impersonal verb, as, *it shines, it lightens, it rains*, in the use of which the unnamed being is present to the senses, and the attribute is mentally judged or affirmed of it.

(2.) Implied in the nature of the concept as relative. (2.) It is still further implied in the truth already developed, that every notion is by its very nature and essence *relative*, i. e., *related to* individual objects or actually existing things. As a predicable, it is affirmable of individuals; as a universal, it is common,—i. e., it belongs equally to single objects. In other words, the notion is founded, as was shown, upon attributes, and attributes are in their very essence actually taken from, and capable of being restored to, the things to which they pertain.

(3.) In the nature of names. (3.) The same fact is evident from the consideration of the meaning of names, and of what is implied in the expression of notions in language. A name is the verbal symbol of a concept or notion. But to be a name, it must be a name of some object or objects; some object must be called by it; it must be applied to some thing or being. But all these acts imply judgment.

(4.) In the nature of knowledge. (4.) It is implied by the very definition of knowledge. In discussing the act of knowledge, we have already found that it implies judgment, whether the knowledge takes the form of presentation, representation, or thought. We have sought to prove that all knowledge implies more than the apprehension of an object as existing; viz., its existence in some relation. If it is true that knowledge by perception and memory implies judgment, much more does knowledge by thought, forasmuch as we have seen that the general with which thought has to do, is, by its very essence and nature, only a relative and affirmable entity.

We conclude from these data, that

Mutual relations
of the concepts
and the judgment.

Wherever there is a notion, there is an implied act of judgment. Every such notion has been formed by judgment, and is capable of being expanded into a judgment. It is an organic thing, representing in its very essence the act which gave it being and capable of being developed into similar though more complex products. It is like a seed, which is a miniature plant, having come from a plant and being ready to spring into a plant; or it is like the cell which is the ultimate element of growth and development in vegetable or animal life. We do not judge by a mechanical and superinduced act of the intellect, which, finding two names or notions, proceeds to fasten them together; but it is of the very nature of the notion, that it can be applied or united to some object. This natural and necessary act of union or synthesis is an act of judgment. The true doctrine may be stated thus: *every concept is a contracted judgment; every judgment is an expanded concept.*

Judgments are
psychological
and logical.

§ 429. The judgments by which concepts are formed, are properly called *primary*, *natural*, and *psychological* judgments. They are distinguished by the circumstance that their subject is an existing and individual thing. Judgments of the other class are *secondary*, *artificial* and *logical*. In these, concepts, not things, are apparently compared with one another, so that concepts seem to be the only objects-matter.

Judgments of
mental entities.

And yet, in these judgments it is true, that the reason why concepts are affirmed of concepts is, that concepts are, in their very nature, affirmed and affirmable of things. The bond which unites one concept with another in judgments that are purely logical and general is in the last analysis the same bond by which concepts are connected with things. The secondary, comparative, and logical judgments are all founded on those which are primary, natural, and psychological. To be convinced of this truth, we need only to consider the expression of judgments in language, and to trace the order of progress by which logical judgments or judgments consisting of concepts come to be reached and understood.

When purely mental entities are treated of, whether fictions of imagination, as *the centaur*, or mathematical constructions, as *the triangle*, or abstracta, as *virtue*, they are treated as actually existing beings.

How the subject
of a judgment is
expressed in
language.

The fact has already been established, that the concept, by its very nature, contemplates attributes only; and that concepts, like *man*, *human*, *humanity*, so far as their constituent attributes are concerned, stand for precisely the same content of attributes. When they are expressed in language, however, *man* and *human* differ in this, that the one word, *man*, denotes a being to which these attributes belong, and the other, *human*, denotes the attributes only. By what process the mind comes to be possessed of these two sorts of words, we need not here inquire. But when it does

possesses them, it cannot but use them. Instead of thinking or saying, *it* is green, or, *it* rains, the man says, *orange* is yellow, *cloud* rains. Soon it learns to say it in three ways; *this* orange is yellow, *some* oranges are yellow, *all* oranges are yellow, according as it uses the general name for one, a part, or all of the beings for which the orange stands. In order to do this, it applies special terms to denote these three relations, viz., the words *the* or *this*, or *one*, *some* [*a few* or *many*], and *all*.

How does the logical differ from the psychological judgment?

§ 430. The secondary judgment, when its subject is an individual object, differs from the primary only in this, that the subject is denoted by means of a common term. Instead of saying *it*, we say *this orange*. If the subject is a universal, as *all oranges*, the mind gives the result of its separate observations, or their equivalent induction, by using the concept in its largest extent.

Any concept is capable of being subject or predicate.

The fact that a concept has the two relations of *extent* and *content*, fits it to be used both as the name of one or more individuals, and as an attribute only.

When a concept is used to denote beings, it is used in the relation of extent.

When it is used to denote attributes, it is used in the relation of content.

Every notion must have both of these relations, and cannot exist without them. In the natural judgment by which every concept is formed, one of these relations is expressed by intuition, and is represented by the subject *it*; the other is formed by thought, and becomes the predicate *yellow* or *rains*. In the secondary judgment a concept used in its extent only is employed as the subject and takes the place of the intuition or induction; the notion as content retains its place as predicate, and the natural judgment by which the notion is formed and in which only one notion can be used, becomes a secondary judgment in which two notions appear. These considerations fully establish the position that the two species of judgment are in their essential nature one and the same, inasmuch as both express what is essentially involved in the act of thinking, viz.: an act of affirming a concept of an existing being or thing.

The signification of the copula.

§ 431. This relation discerned by this act is expressed in language by the *copula*, whenever the copula appears as a separate word. The *is* of the judgment means the relation affirmed or judged, i. e., known to exist between the being and its attribute. It makes no difference whether it is or is not expressed, it is still present as an element in every judgment, whether it is so united with the predicate as to form with it a single word, or whether it is expressed by the verb *to be*. The act of judgment is the same whatever be its verbal expression, whether subject predicate and copula are condensed in a single word, as, *fruit*—or expanded into two, as, *it rains*—or into three, as, *the clouds are raining*.

The copula does not imply actual existence.

The copula does not require or imply that the being should actually exist in fact, that there should be an actually existing material or spiritual thing or agent, of which the attribute is affirmed or thought. The being may be an imaginary being, as a *centaur*, or a mathematical entity, as a *triangle*, or an abstractum as *whiteness*, or *virtue*, or *legislation*; and yet one or more attributes may be asserted or thought of each. All that the copula properly signifies is, that the concept has this or that attribute, one or many. Whether the concept is of a real being or of a thought-being is presumed, or left to be determined by other sources of knowledge. If a centaur is spoken of, we know it has only imaginary existence; if a triangle, that it is a mathematical

conception or construction; if virtue or legislation, we know we must go back to concrete beings, to find the reality of which these are *abstracts*.

Judgments of content and extent. § 482. It has been established that every notion is a contracted judgment and every judgment is an expanded notion, and also that every notion has two relations—the relation of *content* and the relation of *extent*. It follows that notions can be expanded into two kinds of judgments: *judgments of content* and *judgments of extent*. Both these forms of judgment require special illustration.

We begin with the Judgment of Content.

This is the form taken by all original and natural judgments. It is by a judgment of content or of a common attribute or relation that every notion is originally formed. This is also the form in which judgments most frequently occur in language. Objects are observed and their common attribute or attributes are *thought*, i. e., *judged* of them, and the thought when expressed in words gives those propositions which abound in every language. It is only by a reflex act that the mind develops and employs judgments of *extent*.

Natural and scientific judgments of content. These natural judgments of content, serve the purposes of common life and of common intercourse. For the ends and uses of Science we need to go further and to employ propositions of *definition*. In such propositions we assert not merely one or more attributes for purposes of information, but we indicate *all the attributes* which make up or constitute the whole *content*. For example, we are required not only to state some one attribute or relation which is true of man, but all the attributes which are required to distinguish men from other beings; in other words to give the defining attributes or constituents—the definition of the concept. To accomplish this end we must express what is called the whole content, since if we state only those elements which are common to this concept and many others, and omit one or more that is peculiar, we do not define it from the others; that is, we do not separate either the concept or the objects for which it stands from all the other concepts and objects. If we define a circle as a curvilinear figure, the circle is not distinguished from an ellipse. If we define man to be a two-legged and featherless being, this is true also of a plucked chicken. Hence the rule by which we try and determine a good definition: The proposition which expresses it must be convertible. We must not only be able truly to assert 'every triangle is a plane three-sided figure,' but 'every plane three-sided figure is a triangle,' not only 'every man is a rational animal,' but 'every rational animal is a man.'

Essence, real and nominal. The content was called by Aristotle and the Scholastics the *essence*, i. e., attributes or elements which make the notion to be what it is as a notion. A distinction has also been made between the real and nominal essence, and between a real and nominal definition. The real essence is, properly, its entire content, and a real definition would be a statement of this in language. The nominal definition would properly be the definition by an equivalent name or names.

Aristotle himself meant primarily by the essence that which existed permanently and really in the objects to which the concept belonged rather than the attributes themselves as constituting the concept. He applied essence metaphysically rather than logically, to the objective

correlate of the concept, rather than to the concept itself as an intellectual or subjective product Cf. § 399. It is easy to see how the term might be employed first as the constitutive nature of each object or thing conceived, and afterwards be transferred to the species which make up a genus or into which a genus is divided, and finally be applied to every individual or object.

Real and logical truth the copula ambiguous.

§ 433. What is often intended by this distinction is better expressed by the distinction of *real essence* and *thought-essence*, or *real* and *logical truth*. This distinction can be appreciated and understood only as we remember the remark already made, § 431, that propositions may concern existing beings or notions of beings to which there is no corresponding reality. The proposition as a definition only, expands the content or essence of the concept, without deciding whether any corresponding reality exists in fact. When for example we define the centaur we give the attributes that make up the conception without asserting or knowing that no such being exists. When we define a triangle we state the essential constituents of the concept produced by the constructive imagination, knowing that it has no other existence. When we define man we define the concept and believe it is realized in fact and actual being. The definition of centaur implies only thought-essence or logical truth. The definition of man implies both logical and real truth. The copula *is*, in the one case signifies '*is defined as*' or '*consists of*'; in the other signifies—both '*is defined as*' and '*really exists*.'

The import of the copula, how interpreted.

In very many cases we readily interpret the meaning of the copula and the character of the judgment and definition, by our knowledge of the subject-matter. In other cases we have no such knowledge as qualifies us to determine whether the definition is really true, as well as logically consistent. Suppose any of the following concepts are to be defined: *virtue, duty, inalienable right, natural liberty, tyranny, a sovereign state*. It is of essential importance to know whether the definition concerns only the concept as a mental product, existing in and for the mind only, or whether there are real relations and activities of the human soul, to which the concept corresponds. In the first instance we should need to consider only, whether the concept is correctly defined as it is ordinarily used or as this or that school of philosophers or politicians imagined or conceived it. In the second, we should inquire, whether it answers to a truth of fact, i. e., whether the concept has a corresponding reality.

Real and logical truth sometimes confounded.

In the definitions of science, both these questions should be carefully considered. The subject-matter is so far removed from common observation, and the language is necessarily so abstract, especially in those sciences which relate to the human soul or any of its products, that it is not always certain, if the definitions appear to be consistent and complete, that there are answering realities in the actual universe. Scientific truth implies both *logical* and *real* truth. *Logical* truth is but another name for logical consistency. A dexterous logician, if suffered to frame his own concepts and construct his own propositions, may easily frame a system which shall have sufficient truth to give plausibility to all that is defective by omission, or false by positive error. Every definition should therefore be scrutinized in both these aspects and relations. It should always be remembered that a proposition may be logically true and yet really false, while science requires that the definition should not only be logically consistent and logically complete, but also really exhaustive and really true.

We consider next Judgments of Extent.

Propositions of extent, follow those of content.

The proposition of extent is the natural consequent of the proposition of content. The proposition of content is first in time, because the knowledge of the individual goes before the knowledge of the general, or if the two are distinguished together, the general is first known as belonging to the individual and affirmable of it. As soon, however, as a single attribute is affirmed as common to many individuals, then this common attribute can be conceived as itself dividing or constituting these individuals into a class by themselves. As soon as we think, This house is white, it is possible for us to refer the house to the class of white objects. But because every generalized attribute may classify the objects to which it belongs, it does not follow that the mind recognizes it in this relation, or expresses the relation in language. It is not till the adjective, white, becomes a noun, that we use it as a classifier, and think or say, *whites*, i. e., white men, are *English*, *French*, etc., etc., or *white things* are *so* and *so*. It is not till we turn back upon our thinking, and recognize the fact that these attributes divide the beings to which they belong into classes, and go further and notice that some of the classes of objects are wider and some narrower than others, that we have occasion to think of these notions in their extent, or to expand them into propositions of extent.

Of especial importance in science.

Indeed it is not till the formal classifications of science begin to be formed and fixed, that such propositions make much figure in language, or that they are sharply distinguished from propositions of content. It occasionally happens in common life that we find such assertions as the following or their equivalents: Of *trees* there are *oak*, *maple*, *pine*, etc. Of *oaks* there are *white oak*, *black oak*, *rock oak*, etc., etc. The inhabitants of Great Britain are *English*, *Scotch*, *Irish* and *Welsh*. But when our classes are perfected by scientific research, then we find such propositions as the following: The human race is made up of *five* varieties according to *Blumenbach*, viz., the *Caucasian*, the *Mongolian*, the *Ethiopian*, the *American* and the *Malayan*, or into *three* according to *Cuvier*; or into *seven* according to *Prichard*; or into *eight* according to *Agassiz*; or into *eleven* according to *Pickering*. Or the *Mammalia* are divided into *Archonta*, *Megasthenes*, *Microsthenes* and *Ooticoide*, each of which divisions except the first are numerously subdivided. So we say the powers of the soul are intellect, sensibility and will. The faculties of the intellect are three: presentation, representation and thought. Our duties are threefold: to God, our fellow-men, and ourselves. Every such proposition expresses the single relation of extent. The concept is expanded by a distinct and complete enumeration of the narrower concepts by which the individuals which make up its extent are divided. In such propositions, the larger or wider concept is naturally the subject, though it makes little difference which is placed first in the order of writing or utterance: the import is the same whether we say, the inhabitants of Great Britain are English, Scotch, Irish and Welsh; or the English, Scotch, Irish and Welsh constitute or make up the inhabitants of Great Britain.

Logical divisions of propositions of extent.

Propositions founded upon the relation of *extent* appear in logic, as *conjunctive*, *disjunctive* and *partitive*, according to the several uses to which the proposition, or the argument founded upon it, is designed to be applied. We may say, A = a, b and c; or every A is either a, b or c, or every a is A, i. e. is a part of A.

Propositions of content and extent imply one another.

§ 434. Propositions of extent, whether used in common life or for the purposes of science, are clearly distinguishable from propositions of content. It is, however, easy to confound the one with the other; and easy to interchange the one with the other. The one relation is so intimately connected with the other, that we are often tempted to translate the propositions which express the one into those which express the other. We cannot say that man is an animal without implying that he possesses those attributes which are involved in the concept and term animal. Whenever we assert that man is a species of which animal is a genus, we must ascribe to man certain attributes. Conversely we cannot assert certain attributes of man without placing him in a certain class. As soon as we add other attributes to those which are essential to the genus, we must in fact divide this genus into species of narrower extent.

These facts are not at all inconsistent with the truth that we at some times use propositions with sole reference to their *content*, and at other times with exclusive respect to their *extent*. Indeed, the use of propositions of extent is a necessary condition and consequence of logical *division*. If *division* is distinguishable from *definition*, then are propositions of extent clearly distinguishable from propositions of content.

Sir William Hamilton, in order at once to reach the highest generalization conceivable, and to provide for his peculiar theory of the syllogism, treats the relations of both extent and content under the terms and relations of quantity, *i. e.*, of extent only. For example: in the proposition, Milk is white, we may conceive the substance *milk* as contained in the class of white things—or the concept milk as containing white in its logical essence. In both cases we have the relation of a whole to its parts, the difference being, that in the one case a genus contains its species or sorts, and in the other the concept contains its elements. This view is purely logical, being taken and applied merely for purposes of logical convenience. The value of this view for logical purposes is open to discussion. Even if it should be conceded to be very great, it does not follow as a consequence, that the distinction between propositions of *content* and *extent* does not represent two original relations, both of which are involved in the existence of every concept, and the recognition of both of which is implied in every act of thought.

Definition and division perfected in science.

§ 435. Moreover, as the process of *definition* conduces to a completed proposition of *content*, so does *division* culminate in an exact and complete proposition of extent. Both of these processes are involved in the beginnings of thinking. They are only carried forward to their normal perfection when we reach the precise and comprehensive knowledge which science attains. Both are the necessary condition of the formation and use of general terms, and are the constant accompaniments of language. Both are perfected in their ideal aims whenever the definitions in any branch of knowledge become precise and true, and the divisions become orderly and exhaustive.

Relation of scientific to common knowledge.

It is a superficial error but not the less serious, to suppose that scientific knowledge differs in kind from common knowledge; to imagine or reason as though the man of scientific thinking has developed or exercised intellectual powers which are used by himself alone, or has discovered special processes or devised special rules which have no relation to the processes and methods which are natural to the thinking powers. The powers employed by the true philosopher and the uncultured are the same. The common man thinks as really, and in his way he thinks as effectively and as sagaciously, as does the philosopher. He fails in this only, that he

does not judge so carefully, because he does not judge under the pressure and guidance of so definite and earnest intellectual aims. Both define and divide, and in one sense do little else. They are continually pronouncing judgments of extent and content. The one defines with greater exactness and divides with greater care than the other, because he has a constant regard to the consistency of every concept and proposition with every other, and to the coherence of all together in the subordinations of a completed system. Both employ language in the service of their common purpose. The one uses terms with a more fixed and definite meaning and applies them to existing objects with a nicer and more comprehensive observation and induction

Not easy to divide common and scientific knowledge.

It follows that we can nowhere find the dividing line which separates common from scientific knowledge. We cannot say, in the history of any branch of knowledge, Here common knowledge ceases, and science begins. At this point he who knows as a man, begins to know as a philosopher.

Of some sciences it is true, that at a certain period of their development, common terms are exchanged for those which are technical, and a scholastic, sometimes a repulsive nomenclature takes the place of words which are familiar from use and warm with grateful associations. Even objects that in the earliest classifications have been grouped together by affinities so close that they seem to have a necessary and unbroken relationship, are strangely separated; finding themselves suddenly in new and unpleasant society. Plants and trees apparently the most alike are thrown into the most distant groups, and those which are apparently the most diverse and dissimilar are inexplicably brought together. But if we analyze the processes and examine their reasons, we shall find that these changes are owing to no sudden leap over a mysterious dividing chasm, but have been effected by natural progress and easy transitions; that these bristling terms of art are easily translated into their equivalent common words, while the scientific divisions are founded on likenesses and differences that are simply less obvious, but when noticed are fully accepted by the judgment of all men.

In those sciences which are less technical in their definitions and classifications, the points of transition and division are not even suspected. We cannot find the place where science in its technical form begins; and formally takes its leave of common knowledge. In *Psychology*, *Ethics*, *Politics*, *Law* and *Theology*, common terms are in a great measure still retained; only they are employed with a more careful definition and a more exact application.

It does not follow, because common and scientific knowledge differ only in the degree of perfection with which thought is conducted, that the dignity or importance of science is thereby in the least diminished.

Science when viewed in the light of our analysis is simply *knowledge by concepts carefully defined in order to a complete division and methodized arrangement of the things or objects to which these concepts are applicable.*

Science rightly conceived and defined.

In forming scientific notions, the mind discovers relations and attributes which it has never observed before. In looking more patiently, it observes more closely. As it proceeds to use and apply the notions already attained in the processes of deduction and induction which are yet to be explained, it discerns still other relations of likeness and unlikeness. Every new conclusion and generalization prepares the way for new notions which involve new propositions of content and extent. As it proceeds in its triumphant course it still continues to define and divide. It began when it formed its first proposition of content. This involved a proposition of extent.

It will have finished its course and completed the circle of its possible triumphs, when it shall have exhausted all that is knowable by these two processes, each involving the other—when it shall have arranged all its knowledge in systematic order, by a *perfect and subordinated division as the result of true and exhaustive definitions.*

CHAPTER VI.

REASONING.—DEDUCTION OR MEDIATE JUDGMENT.

From Judgment we proceed to *Reasoning* by a natural and almost necessary transition; the one being but a special application of the other. Indeed Reasoning is properly defined as *Mediate or Indirect Judgment*. Of Reasoning there are the two universally recognized forms; *Deduction* and *Induction*. Of these, *Deduction as the Process* and the *Syllogism as the Product* claim our first attention; with both we are made familiar in books of Logic. With the *logical* consideration of the two, however, we need concern ourselves no further than this may aid us to understand the *Psychological* relations of both Process and Product as a method and object of knowledge.

Thus considered, Deductive Reasoning, as a psychological process, is an important topic in the study of the Human Intellect.

§ 436. The process of thought or mode of thinking which we are naturally led to consider next in order is *reasoning*. That *to reason* is a function of the thinking power as defined, will be questioned by none. By many it is esteemed the special function of thought. By some it is conceived to be its sole and single function, absorbing all the rest into itself. There have been those who make the capacity *to reason*, to be the exclusive and distinctive endowment of man. Such have striven to account for all the other thought-processes by resolving them into this.

That Reasoning is a form or mode of *thinking* is evident from the fact that man reasons by the aid of notions, and without *concepts* cannot reason at all. The conclusions which he reaches as the result of reasoning, always embrace at least one such notion; more usually they include two. The predicate of every demonstrated Proposition must always be a generalized notion. The subject is very often such a notion also.

§ 437. Reasoning, also, like every other act or mode of knowing, involves *judgment*. Its conclusion is expressed in a proposition or judgment. The material from which this conclusion is derived, and upon which it depends, is judgments. When we reason, 'this man is a murderer, and therefore is not fit to live': or, 'this man is not fit to live, because he is a murderer': or when we expand the

same argument into the form, 'no murderer is fit to live, this man is a murderer, therefore this man is not fit to live': we express the result of the process in a judgment, and we use one or more judgments in reaching it.

Not only does reasoning imply or involve judgment, but it is itself an act of judgment. It is distinguished from judgment proper by being *mediate and indirect*; whereas *judgments proper are immediate and direct*.

The acts of judgment proper have already been explained as acts in which a general notion is thought or affirmed of an individual being, by, so to speak, direct inspection and comparison. The materials are the beings or objects themselves. These are compared and analyzed in the manner described. The attribute, property or relation is generalized directly from the objects to which it belongs, and is therefore applied to or *judged* of them. When, for example, we judge of ten apples, that they are red, or oval, or round, or of equal or unequal weight, or of similar taste or odor, we perform acts of direct or immediate judgment.

But when we reason concerning them, that because they are red, or similar in odor, therefore they taste alike, we judge indirectly or mediately; we consider, not only the apples themselves, but the relation of one of their properties to another. This truth is implied though not fully expressed in the remark that in judgment we compare *two notions*, and discern or pronounce that the notions agree or disagree; whereas in *reasoning* we compare *two judgments*, and declare or discern that the judgments agree or disagree. This statement, while it does not fully explain the nature of either judgment or reasoning, asserts truly that the two processes are alike in an important feature.

The same truth is expressed in the assertion that in judgment we discern a single relation by comparison of similar qualities or attributes, whereas in reasoning we discern a similarity of relations and by this similarity connect two notions in a single judgment. As every notion is a contracted judgment and every judgment is an expanded notion; so every judgment is a contracted argument, and every argument is an expanded judgment. Judgment and reasoning do not differ so much as processes, as in the materials or conditions with or on which the processes are performed. It is a very superficial view of reasoning, involving not only defects but serious errors, to overlook the relations by which it stands connected with, and as it were grows out of, judgment. To hold that *to reason* is one mode of knowing and *to judge* is another, and that the one goes before, and the other follows after by a necessity or dependence which we cannot explain, fails altogether to satisfy the mind. All who reflect enough to ask the question believe that the relation between the two is more vital and intimate. Cf. Whewell, *Phil. of the Inductive Sciences*. B. II. c. xi. § 1, also Locke, *Essay*, B. IV. c. ii. §§ 1, 2; also Milton, *Par. Lost*, B. V. 486-90.

If we distinguish the *process* of reasoning from the *product* or *result*—as in the other acts of the intellect—we should call the first *reasoning* and the second an *argument*. These two terms are often interchanged for one another, as in other similar cases; and the proper meaning of each is not strictly adhered to in common nor even in philosophical usage. These terms are also usually and almost exclusively limited to *deduction*.

Reasoning,
inductive and
deductive.

The process called reasoning is twofold, *inductive and deductive*. It is known by the two names, *induction* and *deduction*. These two are sufficiently distinguished by the following definitions. In *deduction* the mind begins with general propositions and reasons to those which are particular or individual. In *induction*, it reasons from individual or particular to general judgments.

The two dis-
tinguished.

In *deduction* we assume or imply that the mind is already furnished with judgments or beliefs that are more or less general, and proceed to found upon them or derive from them, those which are particular or singular. In other words we apply the predicate of these general propositions to a particular or individual, which we had not thought of or known before. For example: 'every act of filial duty ought to be performed; therefore, in choosing our business in life, we ought to consult the wishes of our parents.' In *induction*, on the contrary, we proceed from the singular or particular to general propositions or truths. We possess only individual facts, or less general truths, and by means of these we know more general truths, principles or laws. We observe that one or several pieces of iron-ore, with certain characteristics, are magnetic. We infer that every similar piece of iron-ore is magnetic. From the individual and the particular we derive the general.

In *deduction* we begin with the *content*, and we consider the *extent* of the notion, bringing under the latter particular or individual matter that we had not known before to stand under this relation, and we end with uniting this content with a new or more limited notion of extent.

In *induction* we begin with the *extent* of a notion, as this or that particular fact or truth, and we connect it for the first time with a *content* never affirmed of it before. Sometimes, by this means or in this connection we discover a content never previously known or affirmed, of any *content*. As for example, in the contraction of the leg of a frog was discovered the galvanic power with its laws.

Both these processes are called processes of reasoning. The means employed, i. e., the grounds or foundations of each, whether they are general or particular propositions or individual facts, are called *reasons*, sometimes *data*. But to reason, *par excellence*, is to perform the process of *deduction*; and *reasons* or *grounds* of belief are preëminently those *general principles* or *truths* from which we derive or deduce particular conclusions. Hence, when we use the words *to reason* and *a reason*, we are usually understood to have in mind the deductive process. On the other hand, we say freely that we reason by induction or inductively; and no phrases are more common than *inductive reasoning* and *reasoning by induction*.

The two pro-
cesses often con-
joined.

§438. These two processes are usually combined together in every case in which our knowledge is enlarged by what we call reasoning. When we use examples of reasoning for the purpose of illustrating the nature of the process, we seem to be able to separate deduction from induction, and to employ each process separately. But whenever we reason with the express design of enlarging our knowledge by some addition, or of increasing our confidence in that which we

already have gained—we find that both processes are called into requisition. If, for example, we should reason deductively, to prove to a person who did not already believe it, that a particular act, as to obey or perhaps to resist the government, was obligatory; we should probably be obliged to use the process of induction to prove that such an act was distinguished by the characteristics or criteria which showed it to come under the duties of a loyal citizen. To establish this satisfactorily, might require another and perhaps more than a single process of deduction, but inductive processes would also be required.

In all cases of induction, also, when the mind is first actually in doubt and afterwards attains to satisfaction and discovery, the process of deduction is brought into requisition. We can scarcely suppose that Franklin established the identity of lightning with machine electricity, or Newton reached the law and the fact of universal gravitation, without asking themselves many times over what would be the consequents in fact, if either of these were truths; that they might be able to decide by the verification of experiment, whether these deduced consequents were true. We know that Sir Isaac Newton drew certain inferences from the supposition that the law of gravitation was true, when combined with a false datum in respect to the earth's diameter; and because observed facts did not coincide with the theory, he rejected or held in suspense the theory which his so-called induction had already reached.

Induction, and Deduction like the Analysis and Synthesis of which they are special forms, accompany each other in all the higher processes of thought. Often very intimately blended. The two blend together so intimately that it is often difficult to sever them, or to find or trace the line where the one begins and the other terminates. They run together so readily and are so intimately united, that it is often hard to decide whether the process is *inductive* or *deductive*, because it is difficult to decide with which the mind begins—the particular or the general, or whether both these relations are not considered together.

Reasoning, an act of knowledge and of thought.

§ 439. Reasoning, in both these forms, is an act or mode of knowledge. It is also more specially defined as an act or mode of thinking. As an act of thought it is required that its object-matter or material should be notions or concepts. But an act of knowledge has been defined as involving, not only the apprehension that special objects are or exist, but that they exist in certain relations. The object-matter of reasoning being concepts or objects as notionized, it remains to consider what are the relations under which these are known in reasoning. This inquiry has in part been answered. To reason, is to know objects by means of or in relation to their reasons or grounds. In other words, to reason is to discover or apply reasons for what we discover or already believe to be true. These definitions and explanations must suffice concerning reasoning in general; they serve to prepare for and introduce the particular consideration of each of its forms. We begin with—

Deduction and the Syllogism.

§ 440. There is a general agreement of opinion in respect to the views which have thus far been expressed. The propositions which we have laid down would be generally assented to. It is true, they would be somewhat variously interpreted and explained according to the special system or school of opinion in metaphysics and psychology to which the interpreter belonged, but the propositions themselves would command almost universal assent. But when we come to a more precise and accurate theory of Deduction and Induction, we find great vagueness as well as great diversity of opinion. We cannot excuse ourselves for this reason from the attempt to ascertain and vindicate the true theory of each. We are compelled to make a critical and separate consideration of these two processes, and of the forms of language in which they are recorded and expressed.

It should here be premised that our point of view is primarily psychological and not logical or metaphysical. We are directly concerned with the inquiry 'What are the intellectual processes which we actually perform when we reason?' The answer to this question does indeed involve the development and determination of the objects with which the process is concerned and the relations which it pre-supposes; and, in so far, it implies *logical* and *speculative* discussions. But *logic* discusses reasoning, and especially deduction and the syllogism, for other ends than to ascertain the psychology of the process and the consequent nature of the product which it educes or creates. It considers them chiefly for the purpose of establishing the rules and criteria which guide to correct, and secure against false reasoning. It analyzes and studies the various forms of language in which valid and invalid syllogisms can possibly be phrased or expressed, for the purpose of showing the relation of the one to the other so as to aid the reasoner in securing himself and in guarding others against fallacious and sophistical arguments. The *metaphysical* consideration of reasoning goes still farther. It analyzes and evolves the original conceptions and primary truths which reasoning pre-supposes, and on which its authority rests. Psychology does both of these indirectly but does neither primarily and confessedly. It is chiefly concerned with what the intellect consciously performs and produces, and the treatment of the conditions and objects which our subjective processes presuppose and evolve.

§ 441. Our chief inquiry is, what is the proper conception of the *deductive* as an intellectual *process*; and incidental to this, what is the nature and what the results of the *product* which it evolves. Perhaps we can answer this question most satisfactorily if we consider first of all, the forms of language in which the process is expressed and its results are preserved.

These forms are two, the *Enthymeme* and the *Syllogism*, or the abbreviated and the expanded syllogism. The enthymeme consists of *two* expressed propositions, which are connected by *because* or *therefore*. The syllogism consists of *three*, of which the first two are simple assertions, and the third is introduced by *therefore*. For example, *M* is a { *usurper* / *lawful ruler* } *therefore* he { *cannot exact obedience* / *ought to be obeyed* } or *M* { *cannot exact allegiance* / *ought to be obeyed* } *because* he is { *a usurper* / *a lawful ruler* } are examples of the two forms of the enthymeme. { *No usurper can require allegiance* / *Every lawful ruler ought to be obeyed* } *M* is { *a usurper* / *a lawful ruler* } *therefore* *M* { *cannot require allegiance* / *ought to be obeyed* } are examples of the expanded syllogism.

In the *enthymeme*, the first proposition may be either the *conclusion*, or it may be the *reason*. In the *syllogism*, the first proposition is called

the *major premise*; the second, the *minor premise*; and the third, the *conclusion*.

The middle term. Its significance.

The two premises of every syllogism must have one term common to both, which is called the *middle term*. In the examples given—*lawful ruler* and *usurper* are the middle terms respectively of the two syllogisms. Unless there is this middle term, there is no force or convincing power in the argument. It is obvious that if we substitute any other term in either premise so as to introduce two middle terms, there is nothing to lead to a conclusion. If we substitute a worthy or unworthy person for lawful ruler or usurper, no conclusion will follow.

Every enthymeme can be expanded into a syllogism. The syllogism when expanded expresses in separate propositions the truths which the enthymeme implies. There is in every enthymeme the suppressed premise of a syllogism. When we reason in the examples given, *M* is a lawful ruler, therefore he ought to be obeyed, or *M* ought to be obeyed because he is the lawful ruler, we believe and imply in the argument—though we do not assert—that every lawful ruler ought to be obeyed. This is the major Premise of the syllogism into which the enthymeme is by this addition naturally expanded. The difference between the enthymeme and the syllogism is only a difference between a contracted and an expanded form of expression; or between an elliptical and a fully explicated sentence. It is a difference of language only, and not in the least a difference of thought or of the relations of thought or knowledge; what is expressed in one being implied in the other.

Is the syllogism a or the form of deduction?

§ 442. It has been earnestly disputed whether the syllogism is the form proper to all deductive reasoning or only a form after which all such reasoning may be conducted and in which it may be expressed. Thus, Principal *Campbell* in his *Philosophy of Rhetoric* contends that the syllogistic is only one of the possible methods of reasoning, while there are others which are in many cases greatly to be preferred to this; and *J. S. Mill*, in his *Logic*, urges that it is not a form of reasoning at all, but a convenient expedient for recording and referring to our experience of particular or individual cases. It is obvious for the reasons already given, that it is a form into which all deductive reasoning may be phrased, and it is the one and the only form in which all the materials considered and the relations involved are fully stated in language. We concede that it is a form of linguistic expression or phraseology, but it is the form appropriate to deduction, because it brings out in language all that is thought in the mind. When for example we supply the premise that had been suppressed in the enthymeme, we do not add that which is superfluous to the process through which we have gone or to the argument which the process implied. We simply express in language what we had thought or were ready to think in fact—that which if we had not believed when we drew our conclusion, we should not have reached it at all. Thus, if we did not believe that all lawful rulers ought to be obeyed, we could not reach the inference that *M* ought to be obeyed be-

cause he is the lawful ruler. We conclude therefore that the correct view of the syllogism is, that while it is not essential that any process of deduction should be stated in this form in order to be valid, yet this is the form in which every such process must be expressed when it is fully expanded in language.

The Syllogism a completed process and product of deduction.

Again; In the syllogism the process of reasoning is *fully* expanded and complete. It cannot be enlarged or extended into any form which is more complex. Any additional propositions, whether connected with either of the premises or with the conclusion, are seen at once to be a premise or a conclusion of another process. If for example we enlarge the premise, 'all lawful rulers ought to be obeyed,' by the reason 'because it is the will of God, or an obvious duty,' we find ourselves performing an additional process of reasoning, the object of which is to prove that the first premise is correct. If we add a reason for holding that M is a lawful ruler, as 'because he has been properly commissioned or fairly elected,' we do the same for the second premise. If we annex to the conclusion an additional remark, as 'therefore M ought to be obeyed, and to disobey him is a serious crime,' we simply introduce a second conclusion, which requires another argument to support it.

Possible changes in the form of the syllogism.

Every argument, whether positive or negative, whether the propositions are universal or particular, can be expressed in the form which has already been stated, by changes in the phraseology or the position of the terms, without affecting the sense or the force of the argument.

This is demonstrated at length in every treatise on formal logic. A few examples will suffice for our purpose. If we make the first premise negative by substituting 'no lawful ruler should be disobeyed,' the real nature of the argument is not changed. The same is true if in the second premise we substitute 'some persons,' or use a part of a class as an equivalent to a smaller whole.

If we change the form of the first premise by inverting the order of the terms or by converting it, which we can do with the negative premise and retain its full meaning, we bring the middle term into the predicate of each of the premises; but the argument and its power to prove a conclusion are the same.

If we convert in a similar way the second, or minor premise, it brings the middle term into the subject of each premise, but this does not alter the strength of the argument.

If we transpose the order of the premises, the relations of each part to the conclusion is the same, whatever may be the order in which the two are uttered. These are the only changes possible in the mutual relation of the parts of the syllogism, but none of these affect the nature or force of the argument.

Problem or question proposed.

§ 443. We may therefore safely conclude that the form of the syllogism which we have first stated is as good as any other to illustrate and exemplify the nature of the process of reasoning.

We proceed therefore to inquire, what does the analysis of the syllogistic form teach in respect to the nature of deduction as a psychological process. As it is a full expression or expansion in language of all the materials required and all the relations involved in an act of reasoning

no way can be so satisfactory and decisive of knowing what it is to reason, as to analyze the syllogism.

We find first of all, that in every syllogism the force of reasoning depends on what is called the *middle term*. We have already observed that in every convincing syllogism one term must be used twice. Not only is this necessary, but this term must stand in a fixed relation to each of the remaining terms, or no conclusion can be reached.

The middle term significant.

That relation is indicated by the maxim announced by Aristotle, which is usually called the *dictum de omni et nullo*.

It is as follows: *whatever is predicated of a class either affirmatively or negatively, may be affirmed of whatever is contained in or under the class.*

The original passage in Aristotle, upon which the dictum is founded, is the following: 'Ὅσα κατὰ τοῦ κατηγορουμένου λέγεται, πάντα καὶ κατὰ τοῦ ὑποκειμένου ἰσχύουσιν. (Cat., c. v. p. 3, b 4); cf. *Analyst. prior.* I. 37, p. 43 a 25; I. 28, p. 43 b 39. *Top.* IV. I. p. 121 a 25. We subjoin the following note of Trendelenburg. Idem præceptum quasi syllogismorum fundamentum posteriores logici varie extulerunt aut in hunc modum: nota notæ est etiam nota rei, repugnans notæ repugnat etiam rei, (nota autem nihil fere aliud quam prædicatum,) aut in hunc modum: quidquid de omnibus valet, valet etiam de quibusdam et singulis; quidquid de nullo valet, nec de quibusdam et singulis valet. (*Biem. Log. Arist.*, p. 89).

The middle term like every concept, stands to other notions in the two relations of *extent* and *content*. 'A notion that is or is not in this extent, may or may not take to itself the notion which is its content.' This last formula has the advantage of stating concisely both the likeness and the difference between an act of judgment and an act of reasoning. In an act of judgment, as we have seen, a concept may be expanded either in the direction of its extent or of its content. So far as the single act of judgment is concerned, the notion is viewed in only one relation, that of its extent or of its content, as the case may be. In an act of reasoning, a notion, i. e., the middle term, is viewed in both these relations at once, as it were, and the result is that a relation is observed between notions, where it had not been discerned before.

We set aside, as not material to our purpose, the special construction of the syllogism proposed by Hamilton (*Met. Lec.* 37), by which the relations of content are resolved into those of extent, and the maxim *de omni et nullo* is displaced by the following maxim; 'whatever is a part of a part, is a part of its containing whole.' We grant that it is possible to contemplate and express the relations of content always as those of extent. In the example, *all lawful rulers ought to be obeyed*, we may say, the concept, *all lawful rulers*, is a part of the notion, *ought to be obeyed*, and M is a part of *all lawful rulers*, therefore M is a part of the containing whole *ought to be obeyed*. To express every syllogism in the language and under the relations of quantity may or may not be convenient for any proposed logical analysis, but it does not set aside the relations of quality, and their importance to the act of reasoning. The distinction still remains between the attribute or property, and being or substance; on which, as we have seen, rests all the possibility of forming the notion, and of using it in judgment.

But whether we adopt the maxim of Aristotle or the maxim of Hamilton, it is all the same with our view of the middle term of the syllogism. It still remains fixed that the middle term must be comprehended under, or excluded from, another general term, in order that a conclusion may be reached.

The theory of the syllogism which founds the conclusion on the relation of agreement between the terms is nearly allied to that of Hamilton. According to this view the major and minor terms are conceived to *agree* (or *not to agree*) with the middle term, and consequently to agree with one another. What is meant by *to agree* with, is not very clear, unless the terms denote mathematical quantities, and the parts of syllogisms

are resolved into a series of equations. If, however, the phrase mean to be interchangeable in the conversion of propositions, then we have the theory of Hamilton, whose chief object seems to have been to serve

Dictum of agreement or non-agreement of the terms.

an analysis of the syllogism which should dispense with the necessity of conversion and reduction (*cf. Log., App. V. and X.*).

Dictum of substitution.

Another theory, founded on the interchangeableness of the terms, makes reasoning to be a process by which we are justified in substituting one term for another. For example, All men are mortal, etc., signifies : Wherever you find man, you can substitute or read mortal : Wherever you find Peter, you can read man ; therefore wherever you find Peter, you can read or substitute mortal. Both these views present,

in principle, nothing new. They are founded on mathematical relations, from which the illustrations and language are both derived.

Dictum of J. S. Mill.

J. S. MILL urges that the relation of the general to the particular is a mere accident in the syllogism ; that we reason from the particular [the individual] to the particular [the individual] ; that the use of general propositions is a mere matter of convenience, in so far as it enables us to refer, in a convenient form, to some of our experiences in the past, and to apply any one of them to the individual present. For example, it is in no way essential to the conclusion, that we be able to state *all lawful rulers ought to be obeyed*, for we should reason that M ought to be obeyed, from any single example of a lawful ruler who ought to command obedience. "If, from our experience of John, Thomas, etc., who once were living, but are now dead, we are entitled to conclude that all human beings are mortal, we might surely, without any logical inconsequence, have concluded at once from these instances, that the Duke of Wellington is mortal. The mortality of John, Thomas, and company, is, after all, the whole evidence we have of the mortality of the Duke of Wellington. Not one iota is added to the proof by interpolating a general proposition." "Not only may we reason from particulars to particulars, without passing through generals, but we perpetually do so reason. All our earliest inferences are of this nature. The child who, having burnt his fingers, avoids to thrust them again into the fire, has reasoned or inferred, though he has never thought of the general maxim, fire burns. * * * He is not generalising ; he is inferring a particular from particulars. * * * From the considerations now adduced, the following conclusions seem to be established : All inference is from particulars to particulars ; general propositions are merely registers of such inferences already made, and short formulae for making more. The major premise of a syllogism, consequently, is a formula of this description, and the conclusion is not an inference drawn from the formula, but an inference drawn according to the formula, the real logical antecedent or premises being the particular facts from which the general proposition was collected by induction." (*Logic*, B. II. c. 3, §§ 3, 4. *Of Locke Essay*, B. IV. c. 17, § 8.)

How related to the dictum of Hamilton.

The doctrine of Mill is just at the opposite extreme from the doctrine of Hamilton. Hamilton makes the syllogism and deduction to depend solely on the relations of *content*. Mill excludes these altogether, and makes the relations of *content* to be sufficient and sole. "The major premise, which, as already remarked, is always universal, asserts, that all things which have a certain attribute (or attributes) have, or have not,

along with it, a certain other attribute (or attributes). The minor premise asserts that the thing or set of things which are the subject of that premise, have the first-mentioned attribute ; and the conclusion is, that they have, or that they have not the second. Thus, in our former example, *all men are mortal, Socrates is a man, therefore Socrates is mortal*, the subject and predicate of the major premise are connotative terms, denoting objects and connoting attributes. The assertion in the major premise is, that along with one of the two sets of attributes we always find the others ; that the attributes connoted by man never exist unless conjoined with the attribute called mortality. The assertion in the minor premise is, that the individual named Socrates possessed the former attributes ; and it is concluded that he possesses also the attribute mortality," etc., etc. (*Logic*, B. II. c. 2, § 3.

It is rather singular that Mill should have overlooked the fact that many of the scholastics adopted precisely the maxim which he propounds, without dreaming that they introduced a principle inconsistent with the dictum *de omni et nullo*. The maxim, *Nota nota est etiam nota rei, repugnans notis repugnans rei*, is exactly coincident with the maxim of Mill. *Of Twisten., Logic inebondere die Analytik*, 1826, §§ 106 and 162. Trendelenburg, in the passage cited (§ 443), affirms that the two maxims coincide.

We proceed to affirm that

§ 444. The relations of a *part* to a *whole*, or of both *extent* and *content* combined, do not give to the premises of the syllogism the power of demonstration. They *suggest* but

None of these dicta satisfactory.

do not express the relation which furnishes to the deductive process its convincing power over the mind. While it is necessary that in every syllogism the relations of part to the whole should be expressed ; yet this is not the relation which gives to the deductive process its importance as a method of knowledge. No syllogism is valid to which the *dictum de*

omni et nullo cannot be applied, but it does not follow that the maxim contains the real ground of our faith in the process which the syllogism expresses in language. It may be taken as a decisive criterion and sufficient rule by which to judge whether a syllogism is conclusive or fallacious, and yet only suggest without expressing *what actually influences* the mind to accept the conclusion. The relations, of both major and minor terms to the extent and the content of the middle, may be the only relations that are expressed in language, and yet not furnish the real relation which leads to our belief or knowledge. The rule *de omni et nullo* may test every syllogism without stating the relations on which the argument rests for its force to compel assent.

In point of fact, every attempt to explain the deductive process, as such, by these relations, has failed, and the failure of these attempts has perpetually exposed the doctrine of the Syllogism to suspicion and contempt. Cf. Locke, *Essay*, B. IV. Chap. 17, § § 4-8; G. Campbell, *Phil. of Rhetoric*, B. I. Chap. 6; D. Stewart, *Elements*, P. II. Chaps. 2, 3 & 4; J. S. Mill, *System of Logic*, B. II. Chap. 8; S. Bailey, *Theory of Reasoning*.

The objection usually urged against this construction of the Syllogism and the deductive process, is that they involve a *petitio principii* either in one of the premises or in the conclusion, making the process to be either a needless repetition of what is already known or a trifling explication of what was obviously implied. For example, it is said by some, we cannot already know that every lawful ruler ought to be obeyed, unless we have considered the case of every particular ruler, past, present and future. But if we have done this we have already considered and assented to the conclusion that M (one of the cases) ought to be obeyed, and it is useless to prove it by a process of deduction.

To this it is replied, that we rarely if ever obtain our knowledge of what is true of a whole class, by the observation or experience of what is true of each individual included under or within it. We do not obtain our knowledge of any whole, by an enumeration and summation of what is true of each of its parts, but by the process of induction, through which we gather or are led to believe that what is true in a limited observation of a few individuals, is true of the whole class.

But let this be granted, and it follows that the Syllogism and the deductive process rests upon, and is but another name for, induction. This view of the Syllogism is taken and earnestly defended by J. S. Mill. But this involves the

conclusion that the deductive process is a mere matter of form, and that demonstration and argument are superfluous; that processes for proof are matters of convenience or of form, and that the Syllogism is useful only as an exercise for ingenuity or a discipline to dexterity in analysis and acumen. It is obvious that if induction gives the major premise in the form of an assertion of a whole class, as that all lawful rulers ought to be obeyed, then it is mere trifling to add that M is of this class in order to prove that he ought to be obeyed. For as soon as we recognize that he belongs to this class, we must know at once that he ought to be obeyed without the form or process of proof.

This last does not follow of necessity, as we shall show in its place (§ 463), for we might know these truths or facts without having our attention called to the relation which subsists between them. To direct the attention to this unnoticed and unthought-of relation, might be the simple and sole object of the deductive process, and the importance and difficulty of doing this might be quite sufficient to explain the necessity of deduction as a separate process.

Class relations do not explain either process.

The real error or defect consists in making the essence or import of both induction and deduction to consist in classification and the apprehension of class relations. If induction consists only or chiefly in establishing general facts by extended observation, then deduction must by consequence signify the recognition of what must already have been known in the formation of the class. If induction is a synthesis of individuals into a comprehensive whole, then deduction must be an analysis of this whole into its parts. If the synthesis has been carefully made, then the analysis is unnecessary because it is superfluous. According to this view of the two processes deduction is only subsidiary to induction, and when we seem to perform the process of demonstration or proof, it is *the inductive* and not *the deductive* element which gives it any value or force.

Whately's doctrine of the Syllogism.

To the objection that deduction involves a *petitio principii* and is therefore superfluous and without meaning or force, Whately, (*Logic*, B. IV., Ch. 2, § 1,) replies by admitting that the conclusion is virtually contained or implied in the premises; but 'it does not follow that the deductive process is therefore superfluous, inasmuch as it may be necessary to develop or draw out that which is already implied or folded up in the premises.' This reply is to the point, and contains an important truth. But this truth is not consistent with that superficial view of induction which makes it to consist of the synthesis of many individuals into a class. It is not easy to see how any fact or truth can be implied or *virtually contained*, or how it can be folded and hidden, in any proposition concerning a class that is thus constituted, or how there can be any thing to *develop* or *draw out* from it, which was not already known.

The relation of reason to consequent.

§ 445. The relation which is characteristic of the deductive process is that of a *reason* to its *consequent*, or of a *ground* to its *inference*. It is by means of this relation that we know objects in this mode or form of knowledge. This relation is suggested to the mind in many cases of reasoning,—always in the syllogism—by the relation of *a whole* to *a part*, or of a general to a particular, but it is not therefore resolvable into this relation, nor should it be confounded with it. When we say, *all magnets attract iron; this is a magnet; therefore it attracts iron*: the word *all* suggests or indicates that there is some reason founded on the nature or properties of the magnet, which forces us to believe that this particular magnet will do the same. The relation of *whole* to *a part* is stated as a fact, but the fact indicates a *reason*, and it is upon this last relation that the necessity and the convincing force of the deduction always turns. This relation finds expression in language by *because* in the enthymeme, and by *therefore* in the syllogism. *Because* signifies *by cause of*. *Therefore* means *for*, i. e., *on account of that*, viz., that which had been previously stated in the premises; *there* being equivalent to *the foregoing*. Both words signify *by reason of*.

Is a relation of concepts to concepts.

The relation of reason to its consequent or conclusion is primarily a relation of concepts to concepts, by which we are forced to connect one with another in rational dependence or combination. This relation of concepts to concepts depends on the actual relation of cause and effect between objects or things. We are able to give reasons and to support our knowledge by *reasons* because we believe the various objects and phenomena of the universe exist, and are produced in dependence upon

one another. In cases of reasoning when actually existing things are not concerned, with their causes and laws, it will be found that their relations, whether mathematical or logical, are treated or regarded as causal agents, constituting elements or operative laws, and as in this way involving necessitated mathematical or logical relations. (§§ 440, 450.)

Depends on the
relation of causes
and laws.

§ 446. In other words, and in order to explain the thought-relation of reason to consequent or conclusion, and the process of reasoning in which that relation is involved; we must assume that every thing that exists and takes place, whether in the material or spirit world, exists under the real relation of causation or constituting elements and laws. Every phenomenon and every thought-creation in the universe exists by the working of powers with which finite agents are endowed in obedience to fixed conditions and laws, in order to accomplish rational ends or results. Every such existence is an effect; material things, spiritual agents, nay, even mathematical and logical concepts. The nature and the constitution of these effects are all explained by the causes, conditions, and ends, by, under, and for which, they are conceived to exist and to act. All these elements, when applied to explain their existence, or to resolve or confirm our knowledge when we seek explanation or proof, are called *reasons*. When such a reason is discovered to explain or account for a fact or phenomenon, the process is called induction. When it is applied to give or confirm knowledge concerning a fact or truth in respect to which the mind seeks to be informed or convinced the process is called deduction. To know by either or both of these processes is to know by reasons, *i. e.*, it is to reason, *ratiocinari*; it is reasoning, *ratiocinatio*.

How does this
relation become
a Reason.

But how does a cause, law or end, become a reason? In what way is it that the mind finds in the necessary or constant connection which exists between things, a means to that necessitated knowledge or belief which is gained by reasoning? We answer, reasoning itself, and deduction pre-eminently, is but the recognition of this relation as a means to gain or substantiate knowledge. For proof of this we appeal to the process of reasoning itself. In doing so, we should not employ any of those trivial examples which occur in most books of logic, but rather select some example of the process of deduction when it is of actual use, *i. e.*, when it is employed to relieve the mind from doubt, or to answer its questions as to what is true. We should take a case of knowledge actually gained or of doubts relieved by a process of argument. In every such case we shall find that the mind has no direct access to the object before it, but only one that is indirect. The knowledge is not immediate and intuitive, and cannot be. It is only the cause, the effect or the law, the end or the means,—one side or term,—to which the mind has any means of access. But it knows or may know that under the law of causation this is necessarily connected with the other term. The use of this knowledge for the relief of doubt in the confirmation or the acquisition of faith, is reasoning. When the relation of causation is applied by the mind to this use it constitutes the relation of reason and its consequent. The necessary connection pertaining to causation when thus applied gives convincing force to deduction. It is this discerned necessary connection between a *cause* and its *effect*, *means* and *end*, etc. etc., which is what we call the force of demonstration or deduction.

This is another but not unimportant confirmation of the principle essential to all sound philosophy, that the relations of thought are but reflexes of the actual relations of things, and that every logical process pre-supposes some faith or knowledge in real existence and real truth. The modern tendency has been to resolve the forms of things into forms of thought. It is essential to bear in mind that all forms of thought are but the reflexes of forms of things; that if we do not begin with fundamental assumptions or beliefs concerning things, we cannot explain even the logical or thought-processes on which speculation rests.

That the deductive process and the syllogism are founded on the relation of causality was distinctly taught by Aristotle. He remarks, *Anal. post.* II. 2: *τὸ μὲν γὰρ αἰτιὸν τὸ μέσον*, which means in this connection, the middle term is causal in its significance. The entire passage is thus translated by Waits: 'quum omnis questio jam in eo versetur, ut rei subjectæ naturam sive causam per quam res ipsa existat, vel ob quam aliud quid de ea prædicatur, exploremus, quam quidem causam terminus medius exprimere debet.' *Ar. Or.* To the like effect is the passage, *Anal. post.* II. 13, *τὸ γὰρ μέσον αἰτιὸν*. Aristotle distinguishes between the cause of being and the cause of knowing, translated *ratio essendi* and *ratio cognoscendi*, i. e., as we have explained, between the cause and the reason, but he does not show how the one is related to the other. It has been contended by many modern logicians, for this reason and others, that in the passages cited he may have used cause only in the sense of reason, and that he ascribed to the middle term causal efficiency only as meaning 'causal of the conclusion;' in other words, as the *ratio cognoscendi* in the logical as distinguished from the real sense. The illustrations which he employs prove the contrary, for they are all taken from real causes or agents. Besides, he distinguishes the causes which the middle term denotes as those which involve the absolute necessity of the effect, from those which secure it for the most part, *ἐν τῷ πλείονι*.

The later Greek logicians being more occupied with the forms of the syllogism and its application to the detection of fallacies than with its speculative foundation or its philosophical import, left very much out of view this important hint of their great master. The scholastics committed the double error of believing that the syllogism was the sole instrument of acquiring new knowledge, or of discovery properly so-called, to the neglect of induction, and of supposing that the formal relations of the syllogism constituted and measured all the relations of things. Hence it was so generally received in the Continental schools: that the principles of identity, of contradiction, and the excluded middle—the so-called laws of thought—were the only criteria of real truth and actual knowledge, and that the process of reasoning itself could be explained by these axioms. It would be easy to show how the schools of Spinoza, Schelling, and Hegel were formed if not founded upon this assumption.

Leibnitz is a distinguished and notable exception to this nearly uniform course of speculation. He asserts that, for the purposes of philosophy, besides the principle of contradiction another is required, viz., the principle of the sufficient reason. This is necessary, as he asserts in one place, "in order that a thing should exist, an event should happen or take place, and that a truth should be received." "Pour qu'une chose existe, qu'un événement arrive, qu'une vérité ait lieu." *Lettres entre Leibnitz et Clarke*, iv. § 125. Cf. *Arist. Met.* v. 1. § 9; also Leibnitz, *De Scien. Univ.*, Theod. Part i. § 44. *Monad. (Princip. Phil.)* § 32. But the principle of the sufficient reason of Leibnitz is explained and applied by himself without discrimination to the causes of actually existing phenomena and the reasons of demonstrated truth. That is, the *ratio essendi* is not distinguished from the *ratio cognoscendi*, and of course there is no attempt to show the relation of the one to the other. It is not surprising that a principle so imperfectly enounced did not take a permanent place in the schools of philosophy. Even Wolf himself, Leibnitz's professed disciple and expounder (*Ontol.* § 70 sqq.; *Met.* § 30 sqq.), attempts to resolve the law of causation and the sufficient reason into the law of contradiction. The tendency of modern philosophy has been to consider the law of the sufficient reason as extra-logical (*Hamilton, Dis.* p. 608), or to derive it in both forms of real and logical cause, from the relations of concepts to concepts, instead of founding the *ratio cognoscendi* on the *ratio essendi*, i. e., on the relations of things; thereby inverting the processes of nature and destroying confidence in the grounds of knowledge and of faith.

The reason or ground wider than cause or law.

§ 447. The conception of the logical reason is wider in its range and application than that of the real cause on which it is founded. The real cause is always prior to the effect which it produces. The mind in apprehending or observing its actual workings, assumes or supposes the cause, in order to observe or believe in the actual effect. But in applying this relation for the purposes of reasoning, the mind may begin with the effect and conclude to a cause, as properly as when it begins with the cause and reasons to an effect. Either

involves the other in a connection of thought ; either can be made to imply the other in the order of deduction or reasoning.

The reason and the cause coincide, when from an actual cause, (the conditions and laws being included or supposed,) we reason to the certainty or reality of the effect. Thus the fire did or will fall into a vessel of gunpowder, therefore an explosion did or will occur. They diverge, when we reason from the effect to the cause, or when the effect is made the reason for our belief or knowledge of the cause : as the vessel of gunpowder exploded, therefore heat in some form was present. The known effect is in this case *the reason* for the believed or proved conclusion.

In a similar way we reason both forwards and backwards from the means to the end and from the end to the means, making either the end or the means the reason, and the means or the end the conclusion.

So in moral action we reason from the motives forward to the act or purpose, and backward from the act or purpose to the impelling motives, making either the reason for believing the other, with such reservation as the nature of their mutual activity requires.

§ 448. The distinction should also be noticed between causes
Relation of causes to law. i. e. powers and laws. Laws designate those permanent circumstances or relations which, though not separate agents themselves, modify the production of the effect, so that with or without these, the effect does or does not actually occur, or the energy of the effect varies as these circumstances vary. The best example of a law as distinguished from a cause or agent, is the law of gravitation—according to which the force varies inversely as the square of the distance. For the purposes of reasoning, however, the law may be viewed as a new or varying cause ; i. e., the power in question, *e. g.* gravitation, is known or manifested as a cause which we can apply in deduction, so far as or when it obeys certain laws.

In order that this may be intelligible, we observe that the various conditions on which an effect depends, may, when philosophically viewed, be regarded as its causes. Thus to the effect combustion, heat or a burning substance and the fuel are both requisites. The heat, as being able to kindle or inflame, is one active agent. The capacity of the substance to be inflamed, is another agency. Nothing in the universe is entirely passive, but that which is eminently active, is called the cause *par excellence*, while that whose efficiency is less conspicuous is called the condition. Their joint product is the effect.

§ 449. When we employ reasons to prove geometrical truth,
Geometrical reasons. we proceed in a similar method, and the grounds of our procedure and the consequent belief, are found in the nature of the product regarded as dependent on certain efficient or constituting elements which are viewed by the mind as necessitating certain products or effects in a way similar to that in which an agent, whether material or spiritual, brings to pass its results. The triangle, square, cube and sphere are regarded as possessed of certain properties, which, in their nature, when subjected to certain changes, or brought into certain combinations, make the real existence of certain other properties necessary, and therefore evident to the mind. The *ratio essendi*, or the conceived

properties of the geometrical figures in space as constructed in the mind, becomes the *ratio cognoscendi*. The nature of space, or of bodies existing in space, is the actual *reason* that the mind accepts the conclusion. The geometrical construction has a *quasi* causal efficiency, the effect or consequence of which cannot be set aside; or the construction may be viewed as a joint effect of the mind's activity, upon or within the supposed conditions, as determined by the mind's intuition of space.

Thus: two triangles are similar, i. e., their sides and corresponding angles are equal, because they are the halves made by the diagonal of a parallelogram. The reason is found in the previously constructed properties of the parallelogram. But these properties are determined by the constructive acts of the mind, *space* being assumed as allowing the mind to conceive or construct certain figures. The figures being constructed are divided, i. e., new figures are constructed—they are compared with each other—they are superimposed upon one another—in short, there is a series of consecutive acts passing into effects, the acts determining the effects and the effects being determined or defined by the mind's acts and the material, viz., space, with which it works. We reason from the act, i. e., the cause to the effect, or from the effect back to the act, precisely as when the cause and effect are material. There is no difference in the ground of the certainty when the product is mental. The relation of the cause and the reason is in both cases the same. The reason rests upon the known capacity of the mind to construct such an effect, viz., a triangle or square, by precisely the same genetic or productive acts, under fixed spatial conditions.

What we call the nature or properties of the triangle or square are accounted for by the mind's power to produce them, and the concurring aid of space as a condition or coagent to the effect.

§ 450. The same is true, when we reason from the essential constituents of a logical concept; or construct what some logicians call immediate syllogisms.

These scarcely deserve to be called reasoning proper, as the process is merely formal. But if they are to be so regarded, then the parts and the whole, from which in such cases we reason to one another have been previously fixed by the thinking power, or the power to generalize at all. That is, these are products of the mind's creative energy which are referred in the final explanation to the mind's own acting conformably to the relations or forms of thought, which are assumed as conformed to the relations of things; these relations being regarded as fixed or permanent forces to all like constructions, just as space and number give law to all the objects to which they pertain. These logical products as *wholes* and *parts*, *positives*, and *negatives*, etc., are regarded as causal of certain results to any object brought into certain relations with them. They are reasoned of, as though they were actually existing beings with causal properties obeying unchanging laws. The parts make up the whole and the whole is divisible into parts, because the mind unites these as parts and makes of them a whole, and being so united they must hold true to the nature, i. e., the effect or product which the mind has made by its creative activity. We say, some islands are surrounded by water, because it is the nature of the island to be surrounded by water, i. e., because all islands are surrounded by water. Duty can only be performed by a moral being, because it is of the essence of duty to be performed by such a being. In all such cases we reason from what the mind has produced to what is necessarily involved by what are called the relations of content and extent. These relations we give to every concept which we construct.

These positions will be illustrated more fully in treating of the varieties of deduction.

CHAPTER VII.

REASONING.—VARIETIES OF DEDUCTION.

FROM the analysis of the Deductive Process in general, we proceed to a special consideration of the *several varieties of deductive reasoning*. These are determined by the differences in the subject-matter upon or about which the process of deduction is employed, so far as this subject-matter occasions a difference in the character of the reasons upon which the reasoning depends. Material forces and reasons differ from the psychological and moral. Both these are unlike the mathematical. Those which are purely logical differ from all the others. *The process*, however, is common to all these objects so far as it is deductive, but the subject-matter is in each case so peculiar in respect to the sources from which it is derived, the evidence on which its reality rests, and the method by which the mind gains and uses the knowledge involved, as to occasion a marked difference in what is usually esteemed and called the process of deduction.

§ 451. The varieties of deductive reasoning usually recognized are the *Probable*, the *Mathematical*, and the *Formal*.
The varieties are three; these subdivided.

Probable reasoning again is subdivided into three, the *physical*, the *psychological*, and the *historical*, according as the subject-matter is physical beings and phenomena, spiritual agents and their manifestations, or those combinations of the two which make up human history. It is often called *applied reasoning*, because its materials are facts known by observation and induction, and to the materials thus acquired or furnished, its processes are *applied*.

Mathematical reasoning is threefold, according as it is concerned with continued or discrete quantity, or as it combines the methods appropriate to each. It is *Geometrical*, *Arithmetical* and *Analytical*.

Formal reasoning concerns itself with *pure concepts abstracted from all beings and phenomena*, and with the relations which such concepts involve. It is sometimes technically styled simply logical deduction, and its arguments are called *immediate* or purely logical syllogisms.

§ 452. In *probable* or *applied deduction*, we may for the present assume that the premises are furnished by *induction* and observation. In respect to *induction*, it is for the present sufficient that we affirm that by it we attain the knowledge of general powers, properties or agencies, in the spheres of matter and of spirit. It is in the same way that we reach what are called the laws of nature, *viz.*, those universal conditions of the action of these agents which can be expressed in fixed propositions, and can be regarded as rules or regulators of the occurrence or non-occurrence of their effects or phenomena. Both must be considered, whenever an event is subjected to a process of reasoning. But power and law in their relations to deduction may be considered as the same, so far as each is a reason for the conclusion. In applied reasoning as defined, *induction* is always necessary to furnish major premises, because there can be no reasons, if there are no general or universal powers or laws.

Probable reasoning defined.

For minor premises in these cases, *observation* often suffices, because it often furnishes individual facts or events. When these minor premises affirm any thing of a class of generalized objects, *induction* may be required as well as observation.

This description of reasoning is called *Probable*, sometimes *Problematical* and *Moral*, simply because the subject-matter depends on causes which are contingent, and is not necessarily true. Its reality cannot be proved by demonstrative evidence. As such it is contrasted with the mathematical and formal, the subject-matter of which is in no sense a real being or event, and is dependent on no contingency for its existence or occurrence, but on the properties or relations of mathematical and 'logical concepts. As soon as the premises are constructed by the mind they need no evidence from experience. They are obviously and intuitively true. The terms probable, etc., do not, however, imply that the processes involved are less valid or convincing, or that the premises or conclusions are less trustworthy.

Founded upon causes and laws.

But whether the reasoning process, as such, relates to facts of matter, to facts of spirit, or to facts of history, it rests upon reasons in the way already explained. The facts are reasoned out whenever the power or law with its conditions is employed to prove that they must have occurred, inasmuch as the causes exist which require them; or whenever facts or events known to exist are explained by being referred to such agencies or laws.

In the sphere of matter.

Thus, the suspended weight let loose, it is reasoned, must fall, because the force of gravitation is always in action; or *the reason* why it fell, or why it ought to be believed that it fell, is that this power was acting at the time. The marble is decomposed by sulphuric acid because the lime has a stronger affinity for it than for carbonic acid. The decomposition of these elements attended by effervescence is explained by the operation of the stronger force over the weaker.

In the sphere of spirit.

In the sphere of spirit, *I reason* that at the thought of Hannibal I shall always think of Fabius, because the two, by association, have become permanently fixed in my thoughts. By a reference to the operation of this power under its laws, *I explain* the fact, that I thought of Fabius a moment previous. In a similar way *I predict* or *explain* a particular purpose or course of conduct on the part of an individual by referring to *the reasons* which are to be found in the joint actions of certain motives and a supposed disposition or kind of character, both these being regarded as agencies of spirit, or as conditions of its action which are regulated by fixed laws.

In history.

The student and Interpreter of history reasons concerning events of the past when he seeks to *explain* them by their appropriate causes and laws, or to *forecast* the future by means of the great forces or agencies,—the so-called principles—through which the course of events and the results of important movements in society can be interpreted.

In the legal argument.

When an advocate reasons for or against the actual occurrence of a certain event, by a reference to known principles of human action, or the testimony of credible witnesses, or when he reasons for or against the truthfulness of a witness, or when, an event having occurred, as a theft or a homicide, he reasons out a theory to explain the event, and reasons against a counter theory, he refers to certain agencies and laws in the world of matter or in the world of spirit, and often in both, as reasons adequate to account for the phenomena.

Why more satisfactory in matter than in spirit.

Deduction is more satisfactory and convincing when applied to material than when applied to spiritual phenomena, because the agencies known in the one sphere are more numerous than in the other, and because the laws according to which these agencies produce their results are capable of being expressed

in mathematical formulae. Hence, in many of the physical sciences we apply the rigor, the certainty and the variety of geometrical deduction, as in *Mechanics*, *Optics*, *Navigation*, *Theoretical Astronomy* and *Chemical Analysis*.

This introduces into the sphere of pure deduction a second element, viz. *the mathematical*, which is combined with that which is *contingent* or *problematical*, in many of the physical sciences, but which in the pure or abstract mathematics, gives character to what is called by eminence *mathematical reasoning*.

Mathematical reasoning.

§ 453. The objects or entities with which mathematical reasoning is concerned, are constructed by the mind itself on the suggestion of, and of course with reference to, certain material things and occurring acts, which are related to one another in space and time. Hence these entities themselves have certain definite relations to space and time, which are called their properties.

We need not here consider all the questions which may be raised in respect to the nature of these objects or the processes by which they are formed. We are concerned with those only which are involved in and give character to mathematical deduction, and which must be understood to explain this process.

The entities or beings to which it relates.

We assume the reality (in some sort) of Space and Time. We assume also that we can construct and represent to our minds, the various thought-objects with which the sciences of magnitude and number are concerned. We certainly find ourselves, at a certain stage of intellectual development, possessed of the concepts which are employed in geometry, general arithmetic, and algebra—as *the Point, the Line, the Superficies, the Triangle, the Square, the Circle, the Cube, the Sphere, the Cone*, etc., as also *the Unit, the Sum, the Difference, the Multiple, the Divisor* and *the Ratio*.

These entities are concepts.

These are properly called concepts or general notions. Like other concepts their constituents are affirmable of the individual objects to which they relate; they have no separately real, but only a relative and therefore a mental existence. The individual objects of which these concepts are affirmable are, as it would seem at first, individual objects of sense or spirit; as when we affirm a line, or point, or superficies to belong to a block of ivory. On second thought, we are sure that the mathematical point, line, or surface, cannot belong to any material object as such, for the reason that there are no perfectly *even* or *sharp* edges or *even* planes in any material object. Nor are there in nature any perfect units, exactly the counterparts of one another. The mind must construct or imagine such entities for itself, having indeed some, and those easily recognizable, relations to the material originals.

These individual entities are then generalized, and become concepts; having a content and extent, and being capable of definition, division, and classification. The individual and the general are however scarcely distinguished by the mind itself. The individual differences are so inconsiderable and for the purposes of mathematical science so unimportant, that they do not come into notice. The attributes and relations which they have in common and which con-

stitute their import, are entirely prominent and exclusive of the others. Indeed, in the mathematical processes the mind passes so quickly from the individual to the general and returns again so suddenly to the individual as not to observe for the moment with which it has to do when considering the nature and relations of the line or triangle which is before it; whether what it observes or thinks of, is this triangle as an individual, or as the representative of all triangles conceivable.

Their properties
not material nor
spiritual.

It is another marked and distinctive peculiarity of these relations, that they are clearly and entirely distinguishable from all other generalized properties. It is impossible that the length, breadth etc. of any material object should be confounded with its sensible qualities, or that the distinctions of number should be mistaken for those properties of matter or spirit of which sense or consciousness takes cognizance. Not only are they clearly separated as a class, but each one of the class is sharply separable from every other. The line cannot possibly be confounded with the surface nor the sum with the difference. Then again the number of the more general of these relations is so limited as to be entirely within the reach of the imagination and the memory. The mind is entirely certain that no one required has been overlooked. The eye can easily sweep over the entire field of view at a single glance.

Can be expand-
ed in proposi-
tions of content.

§ 454. Again; these concepts, like all others, can, as has been explained, be expanded into *propositions of content and extent*. The propositions of content are the definitions which state the attributes which constitute the essence of each of the complex concepts which we form by mathematical construction, as of the square, the triangle, the cube, etc., etc. The best and most satisfactory definitions are those which bring directly before the mind *the act or process* by which they are supposed to be constructed. Thus, a line is defined as a point moved in space, a point is produced by the intersection or termination of one line by another, a superficies results from a line in motion, a solid from a moving superficies, a sphere from a circle revolved about its diameter, a cone from the revolution of a right-angled triangle about its perpendicular. Definitions of this kind also may serve to connect one construction with another, and thus enable us to carry forward the properties of one—a lower—into those of another—a higher.

Definitions pos-
tulates.

We recognize these definitions to be appropriate and true, because we know that we ourselves perform the processes and achieve the results which the definitions describe. Such definitions we sometimes phrase in the language of command, as, *draw me a line, move a plane*, etc. For this reason they are called *postulates, postulata*, i. e., concepts which may be required and assumed without dissent.

The definitions of the concepts of number scarcely need to be given. We assume at once that all men know what they signify. When an explanation of them is required we refer directly to the processes of numbering, as *adding and diminishing*; either by variable or constant rates, etc., etc.

The peculiarities of mathematical definitions as distinguished from all others, arise from the circumstance that they exhaust the entire import or essence of the concept. We are certain that the definitions of a triangle and square are exhaustive. Such concepts are in their very nature transparent, we can see through them as through crystal water to the bottom of a

mountain lake. We know that the properties enumerated perfectly distinguish this concept from every other. The definition does not indeed express all that is true of the concept as related to every other in every conceivable combination, (else reasoning or analysis could not add to our knowledge,) but it gives all that is essential to enable the mind to distinguish it from every other, i. e., to know with entire satisfaction, and adequately to define *what* the concept is with which it has to do.

Mathematical propositions of extent. § 455. The propositions of *extent* are such as these: Triangles are plane and spherical; and each of these are acute, obtuse, or right-angled; and for the same reason that mathematical definitions are exhaustive, mathematical divisions are known to be complete. All divisions of extent grow out of the definitions of content. Inasmuch, then, as these last are exhaustive, on account of the limited number of the elements involved, it follows, that all possible subdivisions which depend upon such elements, can be easily compassed and confidently enumerated by the mind.

Hamilton pertinently observes: "Mathematical, like all other reasoning, is syllogistic; but here, *the perspicuous necessity of the matter necessitates the correctness of the form*; we cannot reason wrong."—*Works of Reid*, p. 701, n.

Axioms of two kinds. § 456. Besides the definitions, there is another class of propositions called axioms. These differ from definitions in this, that they state the necessary relations that are involved in the nature or application of all the concepts of quantity as such, whereas each one of the definitions states either the content or extent of some special concept.

Examples of axioms: such propositions as the following, '*the whole is greater than its part*,' i. e., it is involved in the construction of the concept *the whole*, that it should bear this relation to another concept called its part. The one requires its correlate; involving the relations of greater and less. We construct and therefore conceive the whole by the addition of parts; we construct parts by the division of a whole.

Again, 'if to or from equal quantities we add or take equals, the sums or remainders are equal.' This is also seen at once to be true, and to be involved in the very nature of equality.

How far applicable to Arithmetic and Geometry. Axioms of this first class are equally applicable to arithmetical and geometrical quantity. They affirm the relations which the mind must evolve and discern whenever it measures one such quantity by another. It is of the nature of any quantity to be measurable; it can be known as equal, greater or less, when compared with another quantity. More exactly we say in the concrete; separate objects having relations to either space or time or to both, can measure one another. *Equality, greater-ness and less-ness*, are discerned in and evolved from these acts of comparison. The axioms concerning the equal, the greater and the less, state in general language and in special applications what the mind necessarily believes in every particular case. They do not enable the mind to apply a predicate to the individual *because* it has affirmed it of the general, but they affirm in general what the mind is ready to assent to in every special instance. Cf. Kant, *Kritik*, p. 143, ed. Ros., p. 176, ed. Hart., and *Proleg.* § 2. Kant contends, that though they are propositions

a priori, they are not axioms at all. Mansel, in his *Proleg. Log.* chap. iv., contends that they are analytic; i. e. when we say the whole is greater than a part, we simply express in distinct language what is implied in the concept, *the whole*.

Analytic and
synthetic ax-
ioms.

Axioms of this character are sometimes called *analytic* propositions as contrasted with synthetic, because, as it is contended, they evolve or explicate in the predicate what is impliedly known or assumed in the subject.

There is another class of axioms, such as these: *Two straight lines cannot inclose a space: Two or more parallel lines, if produced ever so far in either direction, can never meet.* These axioms apply to geometrical quantity only. These are clearly synthetical propositions. Whatever may be true of those of the other class; in those of this the predicate contains new matter which the subject does not imply. And yet these propositions are self-evident and intuitively true. They cannot and need not be demonstrated. Their truth is as obvious to the mind as is the possibility of constructing the original concepts involved, or the propriety of accepting certain postulates. In all these cases the mind discerns the necessary relations of objects to space.

Tatham, in *The Chart and Scale of Truth*, chap. i. sec. ii., asserts that axioms are self-evident, but not intuitive, because, as he contends, if they were intuitive, they would "flash direct conviction on the mind, as external objects do on the senses, of all men."

Mathematical
definitions self-
explaining.

The nature and grounds of the evidence for the truth of mathematical definitions and axioms need not here be discussed at length: all concede that we give to both an unhesitating and uniform assent, as necessarily and universally true. Whatever theory is adopted in respect to the method by which we obtain this knowledge, or the evidence on which we ground it, there is no question at all in respect to the clearness and confidence of our convictions. Even those who contend that we accept them on grounds of the uniform experience of their truth,—whether reached by inseparable and ineradicable associations, or through the process of induction,—still regard these axioms as unquestionably true. Those who hold that the mind believes in their truth because it confides in the known results of its own productive activity under the known and permanent conditions of space and time, have no stronger conviction of their uniform and necessary truth.

Do axioms or
definitions sus-
tain deduction?

The question has been earnestly agitated whether the axioms or the definitions are the foundations of geometrical reasoning. It has been very generally held that the axioms are the real *principia* upon which such reasoning depends: that is, that they are the unproved but assumed major premises of which, with certain minor premises furnished by the definitions, all the syllogisms are constructed, that make up the demonstrations of geometry.

It is obvious that the only kind of axioms which can be considered in this discussion, is the first class which we have cited, the so-called analytic axioms. Those of the second class, all would concede, are as truly principles as are the definitions; as capable as they to serve as major premises for syllogisms. They are indeed more truly synthetic than the definitions themselves.

The method after which these demonstrations are conducted by Euclid, has lent a decided support to this view. In all these demonstrations, these axioms are constantly cited as major premises for the truth of the conclusions which are derived from them. His arguments are in substance as follows: All things that are equal to the same thing, are equal to one another. The case of the equality of the two lines or angles to a third is a case of the kind. Therefore, this is a case of their being equal to one another.

Against this doctrine, *Locke, Essay*, B. iv. c. vii. § 10, protests with great earnestness and force, that we do not assent to the general proposition any more readily than we do to the particular conclusion which it was designed to prove, and that the axiom, as a general truth, therefore does not serve as the ground of our belief. The only use which such axioms serve is, in controversy; to silence wranglers, by showing them that they not only believe the particular which is in dispute, but vastly more, *i. e.*, the general which includes it.

Reid, Essays on the Intel. Powers, Essay vi. chaps. v. and vii., holds a different opinion, when he asserts the importance of First Truths or First Principles as the necessary foundations of all our knowledge, and instances the indispensableness of axioms as premises in geometrical reasoning. But when he comes to explain himself, he concedes the justice of the most of Locke's observations.

Principal Campbell, in his *Philosophy of Rhetoric* (B. i. c. v. § 1), takes the same view as Reid.

Dugald Stewart, Elements, Part ii. subd. i. c. i. sec. 1. 1 and 2, agrees with Locke, and contends that the definitions and not the axioms are the foundations or principles of geometrical reasoning. The axioms he does not consider useless, but calls them *elements*, though not *principles*. The definitions he compares to "the hook, or rather the beam," to which is attached a chain supporting a weight, while the axioms "may be compared to the successive concatenations which connect the different links immediately with one another."

For our present purpose, it is of little consequence to determine whether the axioms or the definitions are or are not the principles of geometrical deduction. In the one case we begin our series of deductions with certain general truths that are more extensive than, and are prior to the subject-matter of geometry. In the other we find our first propositions in the definitions, or the further truths which the definitions introduce and make possible.

§ 457. It is more important to observe that what is called geometrical demonstration is very far from being a process of pure deduction. As preliminary to this and coincident with it at every step, there is carried forward a process of preparing the materials concerning which we reason, so that they can be brought into comparison. This is ordinarily termed the construction of the diagram or the drawing of *auxiliary lines*. In some cases these constructions are very easy and simple, in others they are difficult and complex. In all cases they task the power of invention, and of fertile suggestion. The mind must divine or anticipate, or have a presentiment of what it will prove and how it can prove it, as it proceeds with this preliminary construction. It must maintain a continued course of inventing and providing middle terms, so to speak. The preparation of the diagram for the demonstration of the 47th prop. 1st book, of Euclid's Geometry, is no inconsiderable achievement of inventive skill and sagacity.

It ought to be observed, that in order to be certain of the possibility of drawing some of these lines, and of the character of the figures which will result from them, we cannot depend upon either the axioms or the definitions, nor on the results of previous reasoning processes, but we must rely solely upon our direct intuition of the properties and relations of the figures which our postulates enable us to draw, and which our definitions describe. We know, for example, by intuition only, that we can connect the opposite extremities of a square or rectangle, and that the diagonal thus drawn will divide the rectangle into two triangles with a common base. In constructing a rectangle, we must presuppose the space which we circumscribe, and some of the consequent relations to it and to each other of its bounding lines. So soon as we divide this space, we add to this knowledge also, by direct inspection or intuition. The same is true whenever we add to or divide any construction, whether it be original or superinduced.

The construction of geometrical figures. Auxiliary lines.

Tentative processes often required. It should be noticed, that in all cases of complicated geometrical construction, the completion of the diagram is the result, to a large degree, of a *tentative* process. We draw a line, and then observe whether the new relations brought into existence by this construction may serve as connecting links between the point laid down and its proof. The mind, by this process, builds a road, as it were, before itself, and thus goes on, step by step, to the otherwise inaccessible goal. The geometer may not at once see where the path must lie, and may make many vain attempts, before he can cross the space that separates him from his object.

Now constructions furnish new material. The new constructions which we form for each new theorem, furnish fresh material for yet other processes of deduction, and thus enlarge the sphere, by successive syntheses, of the objects to which our deductions can be applied.

The new truths which these new constructions enable us to discover are intuitively assented to in their conditions and their evidence. They are axiomatic, similar to the axioms of the second class which we have already considered. The number of such axiomatic truths made possible by the endless variety of geometrical constructions is well nigh unlimited. With every new construction, some new relation is evoked, and its truth is intuitively assented to.

Geometrical reasoning resolved into construction. The necessity of constructing the diagram in order to elicit additional knowledge has led to a great variety of theories in respect to the nature of geometrical reasoning. Some, as Schleiermacher, *Dialektik*, have resolved the whole of the process into the devising of the requisite auxiliary lines, which being done, they assert that nothing more is necessary than to institute a succession of measurements or comparisons of equal quantities. These overlook the circumstance that the process of deduction is also employed whenever we use general truths as the grounds of particular conclusions. Because the constructive process is an essential, and oftentimes the most conspicuous element, they recognize no other.

Also into induction. Others, like J. S. Mill and Sir John Herschel, contend that all mathematical truth is gained by successive processes of induction, as well the original axioms and definitions as the new truths which successive demonstrations enable us to discern. These thinkers confound the conditions of discerning a truth with the process by which it is gained, and the evidence on which it rests. Because the mind is forced to use individual examples of real things in order to fix its attention upon what it can construct and think of, they conclude that the only possible way in which it can use them is to form inductions (which, by the way, are by J. S. Mill resolvable into inseparable associations). Mill, having resolved the deductive process into induction, could scarcely avoid the necessity of explaining mathematical reasoning by the same principle. The necessity of a continued resort to new constructions in order to make any advancement in such geometrical deductions, furnished him with a plausible ground for this view.

By others, purely hypothetical. Dugald Stewart, *Elements*, Part II. c. II. sec. 3, 1, on the other hand contends, that mathematical reasoning is purely hypothetical. The definitions are the hypotheses which the mind assumes, and we deduce from these the legitimate conclusions. But he does not explain at all how the mind is enabled or induced to form such hypotheses, nor how it enlarges them by successive constructions, with the aid of auxiliary lines and diagrams. And yet, that the mind is somehow capable of forming a limited number of such hypothetical constructions, all in some way growing out of and related to another, he constantly assumes.

Geometrical quantities measurable. § 458. In geometrical reasoning it is necessary that the several quantities should be measured by or with one another.

Indeed the diagrams are constructed, and the needful auxiliary lines are drawn for this end, that the parts may be so prepared that one may be compared with another. As the triangle is the simplest figure that can be constructed, the original measurement to which, in the last analysis, all others are reduced, and by which they are tested, is that of two triangles. In Playfair's Geometry the first act of demonstration and that to which all the remaining attach themselves and are referred, is that of the fourth Prop. by which two triangles are superimposed on one another. The possibility of comparing two triangles being established, we have the means of comparing all those plane figures which can be resolved into

equal triangles. This may be considered another auxiliary step in geometrical demonstration. It is obvious however that this is not deduction proper.

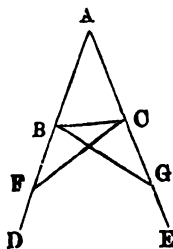
Misapplication
of this fact.

It should here be noticed that the fact that in geometrical reasoning we are constantly establishing relations of equality, in other words are substituting one quantity for another, has led to the belief that this was the aim and type of all reasoning whatever. Hence the effort to explain all the logical relations by those of mathematical equality and to resolve the judgment and the syllogism solely by relations of agreement or substitution. Because on account of its special subject-matter geometrical deduction is the clearest and most rigorous, it was concluded that it furnished the type for all deduction whatever. Hence, *equality, agreement, substitution or identity*, have been so extensively employed to explain deduction. It was not considered that geometrical deduction is only a single species under the common genus, and that the explanation of a process common to the whole genus by relations appropriate to a single species, must of course be unphilosophical.

Geometrical reason-
ing explained
by an exam-
ple.

§ 459. It remains for us to inquire how the process of deduction is applied to the elements and processes of geometrical demonstration which we have described. This will enable us to explain its nature. We can do this most satisfactorily by an example.

In the fifth proposition of Euclid's geometry, B. I., it is proposed to prove that the angles at the base of an isosceles triangle are equal. The first step is to prepare the diagram by producing the two sides A B, and A C, indefinitely towards D and E.



In the lines thus drawn, the two points F and G are taken at equal distances from A, and B G and C F are joined. It is manifest '*to the eye*,' as we say, that we have two pairs of triangles, A B G and A C F, B C G and C B F. The first two have the two corresponding sides equal—the one by construction, the other by the addition of equals to equals—as also the included angle common. By deduction from the conclusion of the fourth proposition, the bases C F and B G and the several angles are proved to be equal. These two conclusions give, in the two smaller triangles, one side of each equal; by subtraction of the equals A B and A C from the equals A F and A G, the sides B F and C G are equal; that their included angles are equal was proved as a conclusion from the syllogism founded on the fourth proposition. It follows by the same syllogism upon the same premises, that the angles B O F and G B C are equal. These equals are, then, taken from the equals A C F and A B G, and the remainders are equal. These are the angles at the base of the isosceles triangle.

It will be seen that the syllogisms employed are either five or two, according as we consider the axioms to be or not to be the foundations of geometrical deduction. There are three cases in which the axioms, if equals be added to or taken from equals, are employed in what, in form, appear to be syllogisms. In the other two the conclusion of the fourth proposition is made the major premise, and the conclusion is regularly deduced. In all, we have a general proposition for a major premise, a particular case for the minor, and the conclusion made up of the major and minor term. That is, there are in all these cases, formal syllogisms; but there is this difference; in the one case the axiom adds no force to the belief of the conclusion, because this would be equally clear to the mind without it; in the other, we are referred to the nature of the concept or construction—as of two triangles equal in two sides and the included angle—as necessarily involving equality in the remaining side of each. The reason for the conclusion is the properties of such triangles as constructed by the mind by means

of the known properties of space. It would be a trivial fiction to say that it is of the nature of equality, that two things equal to the same thing are equal to one another; but this must be said, if the axiom is a reason for the special applications of itself.

But again: we demonstrate or deduce in this way by these two concatenated syllogisms, that the angles at the base of this particular isosceles triangle are equal to one another. But we see at once that it must follow that whatever is true of this or any isosceles triangle must be true of every one. Hence we generalize this conclusion directly, and make it ready to be used as the major premise of another syllogism. This is the last step in the process of a geometrical demonstration. It is not by *induction* proper, however, that we pass from the individual to the general, for the reason that the properties and relations of space which are used in an individual construction in space, do not like those of matter indicate one another with more or less *probability*, but each requires the other by an unavoidable necessity which is open to intuitive inspection.

It scarcely need be said, that there is in geometry much which is called deduction which is not such in fact. It is very easy, in this science, to arrange a series of propositions which shall conform to the rules of formal logic, when there is no force of real reasons. The same may be true in probable reasoning. It is not difficult to assert general truths which have no greater force than the particulars which appear to be dependent upon them.

The processes of arithmetic and algebra are scarcely considered processes of deduction at all, not because deduction is not present and actually performed, but because it plays so inconsiderable a part in reaching the result. The chief concern of the mind in performing problems of this sort, is to invent such combinations and to apply such methods of dealing with them, as will bring to pass the result—which is usually to state some new equation between elements that can be evolved from the data. The mind seeks to change the expression of the quantities given, so that they can be advantageously compared. The mind deduces only when it applies some rule or principle, or uses a formula previously determined to be true of all members or all objects similarly situated with the individual case. Both these processes are similar in principle to the expedient of devising *auxiliary lines* in geometry. The particular result is readily generalized.

§ 460. The third species of reasoning is the formal or purely logical, such as is employed in *immediate syllogisms*. Here the reason for the conclusion is found in some one of the necessary relations of the concept, whenever such a relation or property can be applied or viewed as a cause necessitating some new relation. Inasmuch as there are several such essential relations, a variety of such deductions is possible. Syllogisms of this sort are called by *Kant* *syllogisms of the understanding*, because the understanding is defined by Kant to be the logical faculty. The *relations* or *forms* of the understanding are the grounds or reasons for all such deductive conclusions. These conclusions are sometimes styled *immediate*, in contrast with those which are *mediate*, because they are built upon a single proposition, or more exactly because no *middle term* is present or provided in the ordinary acceptance of the word. The major premise is derived from an expansion in language of those relations which necessarily belong to the concept, and therefore may be expressed in propositions. These arguments are usually treated in books of logic under the title of the *Conversion* and *Opposition* of Propositions, and often are not treated as syllogisms at all.

Immediate syllogisms.

Deduction in arithmetic and algebra.

Examples—Op-
position.

The following is an example, usually cited as of *subaltern opposition*: *All islands were originally attached to a continent; therefore, some islands, or this island, e. g. Ireland, was originally attached to a continent.* The argument in this form is an *enthymeme*. In order that it may be expanded into a *syllogism* the major premise is required: it becomes *whatever is true of all islands is true of some islands; it is true of all islands that they were attached to a continent; therefore it is true of some islands that they belonged to a continent.*

We assert, *No man is perfect; therefore, some men, or this man is not perfect*: the major premise being *whatever is denied of all men is denied of some men.*

Conversion.

In conversion we conclude from *All men are mortal*, that *some mortals are men*. From *No man is perfect*, that *no perfect being is a man*, and so on throughout the cases that are possible, the major premise in each instance being a periphrastic proposition, as the predicate affirmed of *all men* may be the subject when limited by *some*, etc.

It might seem at first that the proper major premise in such cases, should be the more general axiom, as in the first example; *whatever is true of any whole is true of its part*. But on a second thought we correct ourselves by observing, that in such a case no middle term can possibly be devised to connect the major with the minor. The same is true, only more eminently, of what are called the laws of thought—as the laws of *identity*, of *contradiction*, and of the *excluded middle*; no matter is furnished in such propositions, by which we can proceed to a conclusion. They are not laws of thought in the sense of being major premises for deduction. They are rather generalizations of the particular processes which the mind performs, and of the relations which they involve. They are simply rules for logical consistency (cf. § 548).

On what does
the reasoning
rest?

§ 461. The force of the argument in all these cases of purely logical reasoning, is found in the essential nature of the concept, involving certain relations, as of *the whole to its part*, of *the subject to the predicate*, and of *the positive to the negative*. But the nature of the concept is but another name for *properties* or *relations* which the mind necessarily conceives every concept to possess, which the mind must necessarily think it to be, or be able, in other relations, to effect or occasion. The mind cannot conceive it except as a whole, containing parts; *the whole* and *the parts* each having the same content or essence; the *positive* being contrasted with and deniable of its *opposite* or *negative*, and *vice versa*. The mind must respect its own creations, and create according to the relations under or according to which it thinks. These products possess the properties which the mind's creative act gives them, and these must be thought out into all *the applications* or *consequences* which these properties suppose. The purely *logical properties* or *relations* are as truly causes of the object known in the conclusion, as are *physical causes* and *mathematical relations*. So far forth they are used by the mind as the reason of its knowing. It makes no difference whence their efficiency is derived, whether from the act of the Creator, giving force to mental and physical energies under their appropriate conditions; or from the thinking power of man, giving thought-being and thought-properties to the products of its own activity, according to relations which are the very conditions of all knowledge.

All deduction is logical. Logical laws.

In every kind of deduction, whatever may be the subject-matter, we are held to reason *logically*, i. e., with formal consistency; i. e., to deduce according to the formal as well as the real, the analytic as well as the synthetic nature and relations of the concepts which we employ. We must accept and hold to the definitions which we ourselves lay down. If we fail to define our terms we are supposed to accept them with the import in which they are usually received. As rules or laws, to aid us in this logical consistency and rigor, the usually recognized laws of thought have been devised and employed which are known as the *law of identity*, of *contradiction*, and of the *excluded middle* (§ 548).

Technical logical deduction.

We are also required to reason according to the relation of genera and species and the rules which respect the conversion and opposition of propositions. It does not often happen that the so-called logical or pure syllogisms are separately drawn out, because they are so easily followed and the force of the conclusions from them is rarely questioned. It is only when some oversight of these relations is allowed, that we have occasion to separate the reasoning which is purely logical from that which is founded upon the matter, whether this is mathematical or real. In such cases we call attention to the error or oversight by distinguishing the *logical* from the other relations with which it is combined. We then suppose the concepts to be correct in respect to matter in order that we may show the reasoning to be defective in form. We for the moment concede the truth of all the propositions asserted and point out the error in the logical conduct of the argument.

Hypothetical reasoning.

In reasoning which is confessedly hypothetical, where the matter is merely supposed, for the sake of the argument as we say, as in all cases of the *reductio ad absurdum*, and in many instances for the purpose of tracing certain facts or assertions to their consequences, the consequences are said to be the results or conclusion which are required by the *argument* as such. This kind of reasoning differs from the technically logical as in the immediate syllogism, in this, that the reasoning does not turn upon the essential relations of the concept as such, but upon the relations or properties of the object which are conceived to be real. We treat the concepts as though they represented realities. We view them as real. They are to us as if they were real. Thus: we suppose the diamond to be incombustible or the diameter of the earth to be of a given length, or the force of gravity, or the properties of oxygen or hydrogen to be so and so; it makes no difference whether these properties are real or untrue taken, we reason about them as though the objects existed in fact and their relations or properties were correctly conceived.

But in the logical reasoning technically so termed, i. e., in *immediate syllogisms*, the reasons are found not in real properties or mathematical relations, whether they are correctly or incorrectly taken, but upon certain relations essential to the concept as such, which cannot be assumed as hypotheses but are necessarily true of all concepts and objects as conceived. The relations of *wholes* to *parts*, of a *proposition* to its *converse*, of a *positive* to a *negative*, are always the same and always known.

Two elements in most acts of deduction.

§ 462. The foregoing analysis of the varieties of deduction will have prepared us to distinguish, in reasoning, that part of the process which is *preparative* or *auxiliary*, from that which is *simply* and *strictly deductive*. That which is characteristic of every kind of reasoning, is derived from the elements and materials with which these subsidiary processes have to do. But in what we call the act or process of reasoning, the two operations are so intimately blended together, they are so closely and intimately intertwined, that it is not easy

to distinguish the one from the other. For example, in probable reasoning, the force and conclusiveness of the argument may seem to turn chiefly upon the *facts of observation and testimony* which establish the minor premise, or the *inductions* which support the major, and very little upon the act of bringing the two together in the relations of an argument. The auxiliary and preliminary steps are all that are needful. As soon as these are taken, the conjunction of the parts as major and minor, as principle and case, as law and fact, might naturally occur to the mind and give the inevitable conclusion. In geometrical reasoning, as we have seen, the establishment of the conclusion sought for, depends almost entirely on the skilful suggestion of the appropriate *auxiliary lines*, and the *orderly concatenation* of the several arguments, so that they may tend to and issue in one result. In common life, the issue of the reasoning depends upon the establishment of certain facts, in connection with certain principles. Upon the proof of the facts and the enforcement and illustration of the principles, the reasoner expends the resources of memory and invention, of wit and eloquence. The facts being established and the principles received, the argument enforces itself (cf. Trendelenburg, *Log. Untersuchungen*, ii. 280-83).

The invention and establishment of middle terms.

The *invention of middle terms*, or media of proof, is an art or power in respect to which men differ more widely than in respect to the merely logical power, or the capacity to derive conclusions from their premises. There is a greater diversity in regard to the readiness, fertility, and appropriateness of the materials which we can command, than in the power to discern the applicability of the law, the principle, or the reason to the case which we have in hand. Upon skill and aptness in these processes, is founded very largely the estimate in which the ability of a reasoner is held. Preëminence in these goes very far to determine the reputation of a powerful debater or controversialist. But this affluence of invention and skill in selection must be attended with a ready tact in forecasting all the results of a multitude of deductive processes, when applied to all the cases which the fancy suggests. There must be present the power to generalize the highest and the remotest abstractions, the habit of seeing all facts in their relations to their principles and reasons, the capacity to hold the attention evenly and steadily in long and closely-connected series of deductions, all which capacities come only from the special development, and usually from the patient and practised training of the philosophical powers. When these habits are matured by such training, the soul learns to act with the precision and rapidity of intuition. It must so act in order to reason with success when pressed by a powerful antagonist, in the haste and excitement of debate, or under the unexpected and ingenious assaults or defences which are elicited in an active controversy.

Often the most important part of the process.

The establishment of the *principles* or the *reasons* which are involved and required in an argument, is often the point of chief importance. In such a case, the power to discern the widest relations, and to analyze the most subtle properties, comes most into play. Inasmuch as in what is called induction, the deductive power is prominently employed, there can be no question that in this part of the reasoning process, the *logical faculty*, or power of analytic and consistent thinking is especially tasked, and superiority in it is necessarily manifest

The power to fall back upon principles readily and surely, and to apply them to special cases with aptness and force, is the power which distinguishes the *reasoner* from the man of extensive knowledge, the man of fertile invention, the man of ready wit, or the man eloquent in description and appeal. All these endowments, either singly or in combination, give richness and force to the argument. It is a command of the principles that are required to establish the truths or events which are in question, which distinguishes one as a reasoner. To this power must be superadded, *as it is always supposed*, the capacity to proceed with logical clearness and rigor from the reason to the conclusion. When the succession of arguments is complicated and long, when the facts are so numerous as to tend to distract the attention, when plausible reasons for error or falsehood closely resemble those which are valid and pertinent, the power to maintain a series of deductions steadily to their one result is, strictly speaking, the *logical* or deductive power. This marks the *logician proper*, as he is contrasted with and distinguished from the *reasoner*.

§ 463. We are now prepared to answer the question which has been frequently and earnestly agitated, whether *deduction adds to our knowledge*. Many have contended that it does not and cannot. They urge, that if we know the major premise, we already know the conclusion; that when we assent to the major, *All men are mortal*, we have already settled the question, that *Peter also is mortal*, and that whatever advantage there may be in using an argument to this conclusion, it does not add to our stock of knowledge. We do not, it is urged, gain by it any new truth.

To this argument, in the form in which it is urged, we might reply, in the *first place*, that if we substitute for "*we know already*," the phrase "*we might know if we would think or reflect*," there would be less reason to object to it. For the very object of reasoning is often to lead a person to *reflect* or *think* concerning the facts or principles to which he assents. Thus, when a man institutes a process of deduction, or follows one presented by another, one of three things may be true. *First*, he may never have accepted, through ignorance or want of thought, the *major premise*, the principle or reason which it involves, or, at least, not so distinctly as to be ready to apply it in every particular case. But he may be induced to accept it for the first time by the very excitement of the occasion—*i. e.*, by the use or application which is to be made of it. This proposal may so challenge and excite his attention, that he is induced to reflect upon it in order to apply it. *Second*, he may never before have accepted the *minor* so as to be able to connect it with the general truth, even though it had already been familiar to his knowledge and assent. *Third*, he may have accepted both *major* and *minor*, but may never have thought of the two in such a con-

Does deduction
add to our
knowledge?

What a man
may need to be
taught.

nection as to perceive that relation between the two which involves the truth of the conclusion.

This last would not be accepted as possible by those who view the *dictum de omni et nullo* as giving the entire theory of the deductive process. Such persons would contend that we must know the parts before we know the whole; and, indeed, in order that we may know the whole; and that, therefore, if we already know the whole, as expressed in the major premise, we must also have known the parts, thereby rendering the deductive process superfluous. But this *reductio ad absurdum* proves that this theory of the deductive process must itself be defective, rather than that the process itself does not add to our knowledge.

In the *second* place, an argument is usually addressed to a person who has not accepted a conclusion, by a person who has accepted it. The one who uses the argument, knows this conclusion to be true. The person to whom it is addressed does not know it. The argument is the means used to make him know it. In some sense of the phrase, it adds to the knowledge of the person whom it convinces. It ordinarily does this by leading him so to reflect, that he enlarges his knowledge or his belief. *First*, it may be, he is led to accept the major; *next*, he assents to the minor; and *last* of all, he is induced so to connect the two, that he himself is convinced, and of himself accepts the conclusion.

Reasoning is, in fact, constantly employed to enlarge the knowledge of men. It would be idle, as it might seem, to contend that the student of a system of geometry does not thereby add to his knowledge, or that all the knowledge which he gains is acquired by *induction* or *intuition*. It seems to be almost trifling to assert, that a student of philosophy, whether natural, moral, or political, does not increase his knowledge by the study of the many arguments which he encounters; that it is the new facts which he acquires, or the fresh inductions which he makes, which alone increase his acquisitions. Deduction is constantly employed as a means of instruction in all departments of science, and it would seem with the greatest advantage to those who gain knowledge thereby.

It may not be true, that reasoning imparts the knowledge of new facts. It usually happens that the mind has already accepted the facts which are concerned, as unquestionably true. Or, if it should chance that some new fact or facts are established in the course of an argument, it is not the *facts* that are counted of consequence, but it is the *relation* of these facts to the principle or reason which is of prime importance.

§ 464. This leads us to the decisive answer to this view of the deductive process. Knowledge is as truly concerned with the apprehension of relations, as with the cognition of facts. If we turn to the definition of knowledge which was originally laid down, we shall find that the apprehension of relations is as important an element in the process as the apprehension of facts, and that the various sorts or kinds of knowledge are distinguished as truly by the relations which are known, as they are by the objects between which these relations exist. New or additional knowledge is as properly the knowledge under new relations of facts already known or very familiar, as the acquisition of

Deduction, in fact, enlarges our knowledge.

Deduction may not teach new facts.

The knowledge of relations more important.

new facts by observation, testimony, or intuition. Deduction applies reasons to facts or events, in order to establish their truth, or explain their existence or occurrence. It is often required, as we know, to convince ourselves or others that a fact or event must have been true or must have occurred. The man that is convinced by such a process of the reality of the fact, must thereby have gained new knowledge of its relations.

Or, again, the process is applied to explain why it occurred; the fact or event being admitted, the reason for its occurrence is asked for. When that reason is given by the application of the deductive process, the fact is known in a new relation. The knowledge of the fact as explained by its reason is certainly new knowledge. Deduction applies general causes, elements or properties, as *reasons* to confirm or explain events and facts. It not only adds to our knowledge, but it adds knowledge which is eminent for its worth and dignity—thought-knowledge of the highest kind—knowledge in the light of the principles and laws which govern and explain all individual facts and events.

Mr. Herbert Spencer (*Principles of Psychology*), and Mr. George Henry Lewes (*Aristotle*, § 64, 64 a.) deserve great credit for the advance which they have made upon Mr. J. S. Mill, in so distinctly asserting the truth, that what we call the knowledge of *facts* involves the knowledge of *relations*. But they all labor in their exposition of reasoning, both deductive and inductive, under the common defect of being compelled by the fundamental principle of the positivist metaphysicians to reject all relations except those of *co-existence* and of *succession*, i. e., to admit the relations of time and space in some sort, but to exclude the relations of *causation* and *design*. Hence Mr. Lewes is shut up to the necessity of saying, that "correct reasoning is the ideal assemblage of objects in their true relations of co-existence and succession." (*Aristotle*, § 65.)

It is quite remarkable that Mr. Lewes, after proceeding so far in the right direction, should have the boldness to say that the method which recognises two relations, viz., those of *co-existence* and of *succession*, is the *scientific*; and the method which recognises two more, viz., those of *causation* and *adaptation*, is the *metaphysical*, and then should define "metaphysics" as "the coordination of unverified facts," and "science" as "the coordination of verified facts." (Cf. *Aristotle*, § 75.)

CHAPTER VIII.

INDUCTIVE REASONING OR INDUCTION.

We have seen that, in order to perform these processes of deduction which relate to facts and events—the processes called probable reasoning—the mind must be furnished with major premises or general propositions. Whether these propositions express only the extent of a class in which particulars are included, or general grounds or reasons by which some particular is explained or established, it is obvious that such propositions must first be gained or furnished, in order that they may be applied to particular cases. Unless such premises are possessed, the process of deduction has no meaning. It may not be necessary that the major premise which is required in a given case, should have been assented to before the occasion occurs for its application. So far as lapse of time is concerned, there may be no interval perceptible or actually perceived between the act of acquiring

and of applying the general truth. But in the order of thought, the two acts are entirely different. They differ in their nature and in the grounds on which they rest.

The process by which we gain the truths thus applied, is called *induction* or *inductive reasoning*. What is the nature of this process? What are the conditions and grounds of its exercise? What the assumptions on which it rests? What are its applications to human knowledge, and what are the rules for its successful use? These inquiries are all natural and necessary, and present themselves for solution at the present stage of our inquiries.

Inadequate definition of induction.

§ 465. Induction is usually defined as the *deriving of generals from particulars*; and in this is contrasted with deduction, in which we are said to proceed from generals to particulars. This definition is correct so far as it goes, but it is by no means precise or exhaustive. There are many processes conceivable in which we derive generals from particulars which are not processes of induction.

For example: We observe ten oranges, and, noticing them one by one, perceive a common likeness of qualities. We gather the results of our observations into the general judgment or proposition: all these oranges are slightly oval, or light yellow, or yellow mottled with green. It is obvious that such a judgment, though general and derived from particulars, has not been gained by induction. Suppose we go further in a similar direction, and derive a general proposition which should apply to all the oranges which we have ever seen, or all the individual men whom we have ever encountered, or have ever heard of, and assert of the latter: all these have died. Or suppose we assert: all crows are black, all swans are white, meaning thereby all that have as yet existed or have been reported. Or suppose we carry the generalization still higher, and assert: all ruminants—i. e., those observed or discovered—divide the hoof. None of these are the general propositions which are gained by induction.

Inductions of this kind cannot be used in deduction.

That they cannot be, is obvious from the fact, that such propositions cannot be applied in deduction. To seek thus to apply them, would be an idle form attended by no advantage, and leading to no conviction.

If all that we know or had learned was simply: all swans hitherto observed were white, or all men observed or reported have died, we should already have included in the major premise the truth of the conclusion, and it would be idle to expand the knowledge already gained into a form of deduction. Or, if we had not previously determined whether the individuals now concerned were of the class of swans or men, we should not yet be competent to say that all swans were white, or all men were dead; that is, we should not have gained the major required. The moment that the requisite observations were made, and we had gained the major required, we should have gained the conclusion; i. e., we should have gained by observation, what we might propose to gain by reasoning. With such general propositions as premises, deductive reasoning would be either superfluous or impertinent.

“If induction,” says *Galileo*, “must go through every individual instance, it would be either useless or impossible; impossible if the number of cases were infinite; useless, because then the universal proposition would add nothing new to our knowledge.” *Apelt. Theorie der Induction*, Leipzig, 1854, p. 142.

Such inductions styled the purely or only logical.

And yet inductions like these—so-called—have been named by some the only perfect or truly logical inductions. They are called perfect for the reason that the evidence for them is decisive, and cannot admit the possibility of mistake; whatever is true of each part of the extent of the concept, must be true of all when taken together or grouped as a whole. It is sufficient to observe that, if they are exposed to no error, they contribute no truth. They are safe but useless. They admit of no application, except as a convenience for the memory.

Of. Hamilton, *Logic*, *Lec.* xvii. § 62; also *Lec.* xxxiii. § 108; also *Appendix* vii.

Whately, *Logic*, B. iv. c. i., contends that induction is properly applied to the processes of observation or experiment, by which the facts are collected or from which our inferences are made, and that the inference is properly an act of deduction or syllogistic reasoning, the major premise of which is the assertion that the facts observed and generalized represent the whole class.

When they are called truly logical, the process is the reverse of what is called pure logical deduction, i. e., the simple analysis of the extent of a concept into its constituent parts or elements. But the real import and force of logical deduction is, as we have seen, not found in this formal process, or the relations of quantity which it involves. If the induction described is alone worthy to be dignified with the epithet of "truly logical," it is shown to be worthless for the higher knowledge to which logical forms are subsidiary.

Examples of proper induction.

§ 466. That which is properly called induction is a process of another character. It is the results of this process only which are of any use in deduction. Examples of it are such as these. I observe a certain number of oranges, and notice their characteristics, and infer or believe that all oranges have certain peculiarities of form, internal constitution, habits of growth, etc., etc. In like manner, I infer all swans are and must be white; not merely all the swans that have existed, or those which have been observed and described, but the whole species in the past, the present, and future. In such cases we take the examples which we have observed to stand for or represent the entire class.

But by what authority do we thus substitute the whole for a part? By what process do we advance from the observation of a few individuals, or, as the case may be, of a few species, to a belief or certainty that what is true of these few must hold good of all that are like them? The process is certainly unlike that by which we gather our individual observations into a general statement, and say, what is true of the parts separately considered, is true of them all when taken together. For, in every such case, we affirm, what is observed of the few, is presumed or assumed to be true of all. The ground of this assumption is, that the few represent the many—that the parts are a fair specimen or example of the whole.

"C'est cet acte de notre intelligence par lequel nous faisons passer (*ducere* en, *ἐπαγαγεῖν* en grec) à tous les points de l'espace et de la durée, et à une série indéfinie d'existences semblables ce que nous avons observé dans tel lieu, dans tel moment et dans un nombre restreint d'individus, qui est désigné par les philosophes sous le nom d'*induction*. *Hæc*, dit Cicéron (*Topic.* c. 10), *ex pluribus perveniens quæ vult, appellatur inductio* — une *grâce ἐπαγωγὴ nominative*." *Dict. des Sciences Philosophiques.* Art. *Induction*.

Such inductions are constantly made. § 467. It is obvious that such assumptions are constantly made by us, and that upon them rests not only the entire superstructure of scientific knowledge, but all that practical wisdom which we acquire from experience. Indeed, without them, our experience of the past would be of no use for the future. Without these assumptions, the observation of facts or events, and the judgments of similarity and classification founded upon them, would give us only certain summaries of what had occurred in the past, but which could be affirmed only of the objects and events from which they were derived. But we do more with them than this. We apply them to future time and to other objects and events, with entire confidence, and without the slightest misgiving.

We judge of the taste and quality of the food or fruits which we eat, not only by having eaten of one part and inferring in respect to the remainder, but before eating, by an induction founded on the qualities which we discern by the other senses—i. e., by peculiarities of form, structure, color, and smell. We accept or reject, we desire or loathe, that which has not been tried, through our confidence in these carefully observed indications. We do the same with articles of medicine. We do not care to try each fresh piece of rhubarb, or take of every new parcel of arsenic, opium, or strychnine, to be convinced, by actual experience, that the signs by which we know the substance to be rhubarb or strychnine, show that it will act medicinally, or destroy life. We do not care a ferocious-looking dog, or come near a horse who makes vicious demonstrations, upon the wise suggestion that experience has not taught us that this particular dog will bite, or this horse will kick; but we give both of them a wide berth, on the ground of observation or testimony in regard to others like them. We learn, by trial, that certain kinds of soil and certain processes of culture, are favorable to the vine, the strawberry, the rose, and the tulip. We derive rules which we assume will always apply to these plants. In the department of science, we develop oxygen and hydrogen from a quantity of water, and believe that water, whenever treated in a similar way, will give the same gases. By certain broader assumptions, we conclude that electricity causes the phenomena of lightning; that gravitation holds the heavenly bodies in their places, and moves them in their orbits. These various kinds of knowledge are examples, as they are the results of the several assumptions referred to.

In what respects inductions differ from simple judgments.

§ 468. It follows that *judgments of induction* differ from *simple judgments*, in certain important particulars. To return to our first example: we see *ten* oranges with certain well-defined characteristics; or it may be, *a hundred* or *a hundred thousand*. We bring them under their appropriate concepts, and judge or affirm these concepts of the individual objects. In *induction* we proceed further: we add to these simple judgments yet another, viz., that what we have found to be true of these, may be received as true of all others like them. In other words, we extend the original simple judgment to other objects than those to which it was first applied. The ground of the first judgment is facts observed and compared. The ground of the second is what is called *the analogy of nature*. A judgment of induction is then a judgment of analytic observation, added to or enlarged by a judgment of analogy. The judgment of observation is founded or

observed similarity. The judgment of analogy is founded on *interpreted indications.*

The very words *signs* and *indications*, which are used so freely in common life and in science, imply this very truth, viz., that certain events or attributes that are observed, give information of—i. e., *signify* or *indicate*—that which is not thus known.

Relation of experience to induction.

§ 469. What is usually called *experience*, includes *acts of induction*. Simple observation and judgment do not constitute what we usually call experience; for this imports not only that we have made and preserved observations, but also that we are capable of applying the results in parallel cases. This implies the power to discriminate between cases that are, and those that are not similar. Without this power or discipline, observation or bare experience would be possible, but useless. For it would enable us simply to attain and retain our knowledge of the past, but never to apply it to the future.

We could record what we had observed, and generalize what we had compared, but could find neither wisdom nor instruction for the future and the untried. Those who are so ready to oppose facts to inferences, experience to theory, observation to speculation, should always bear in mind, that in the simple experience and observation of facts, there is neither instruction nor use without the added element of induction, which is always a judgment by means of signs or indications; or an interpretation of facts.

In performing this process, or, more exactly, in this part or step of the process, much caution and care are required. It is by no means true, that all the characteristics which occur together in the same object or event, can be judged to be necessary or essential companions. It might happen that

all the oranges which we had eaten, had derived their flavor from a particular tree or soil, and yet were like many other oranges in form, color, etc.; none of which had acquired this taste. The induction that such characteristics indicated this taste, would be false and unauthorized. A man familiar with rabbits might never have seen any which were not gray. It would be a natural but false induction for him to make, that none were black or white. A person might have succeeded with the crop of which he had sown the seed on a particular day of the moon, and have failed in every instance in which he had sown on any other day; and yet the induction might be irrational, that the sowing on that day was the cause of his success. In the history of scientific discoveries, many plausible inductions have been set aside as untenable. In valid inductions, we infer what is familiarly called a real, permanent, and constant connection between the qualities, attributes, or laws inferred, and those which were observed. If we could ascertain and be able to express the grounds upon which we proceed, they might be the appropriate evidence of a wise induction. The criteria by which we judge one process to be legitimate or false, would be the criteria of every correct judgment of this kind. The rules for a correct procedure, if they could be ascertained, would be the rules in which we might confide.

Importance of a correct theory of induction.

§ 470. In view of these considerations, the questions return upon us with augmented interest and importance: What is the ground, what the nature, and what are the rules for a sound induction? They are questions which have often been asked, and not always very satisfactorily or thoroughly answered. As preliminary to the development of the correct answers, and to a satisfactory theory of induc-

tion, we may profitably consider a few examples in which the process has been successfully applied.

Examples of inductions of common life.

The inductions of common life have already been noticed. They differ from the inductions of science, in that their results are incapable of being reduced to universal statements to which there are no exceptions. Nor do they result in the discovery of ultimate properties, agencies, and laws. The inferences which they furnish are usually general maxims to which there may be many exceptions, or undefined and vague impressions which language can neither embody nor impart. They are carried far enough for practical convenience, but not far enough for scientific curiosity or instruction. Their results are seen in the common sense and common prudence which are essential to the performance of the common acts and duties of common life. By means of them men interpret the signs of the material universe, the dispositions and acts of the brute creation, as well as the thoughts and feelings of their fellows by looks and actions. Uncommon skill and readiness in interpreting such indications is termed acuteness, discernment, sagacity, and tact. Less than the usual capacity to make such inductions quickly and correctly, is denominated slowness and stupidity. The average capacity is called *common sense* in one of the senses of this widely-used appellation.

The inductions of science.

§ 471. The *second* class of examples of the process of induction is furnished by the discoveries of science. The inductions of common life are in one sense discoveries, but the indications are so readily interpreted and the inferences are derived with so great unanimity and universality, that the intellectual process (or processes) by which they are made, attracts little attention, and is, therefore, not readily analyzed. But when some new and wonderful agent in nature is brought to light, or some new law of its acting is established, and especially when the power or law is applied to some brilliant or useful result, and we inquire with the greatest interest, How came the discoverer to think of that? How did he satisfy himself that what he thought was true? we are more likely to find an answer to our questions, inasmuch as the steps of the process have often been slowly made, and the considerations which have led to them can be distinctly reproduced.

Franklin's induction of electricity.

We select, first of all, the brilliant discovery by *Franklin* of the *identity of lightning with electricity*. With the electrical agent, or, as it was called in his time, the electric fluid, Franklin was entirely familiar. He was so far master of the methods of developing it in sufficient quantity or intensity, as to be able to produce its ordinary and obvious phenomena, as well as to exhibit phenomena that had previously been unknown. He had the electrical machine and the Leyden jar, and could produce at pleasure the electrical light, and the report following the connection of bodies in opposite electrical conditions. With these, then somewhat novel phenomena, he had become entirely familiar in observation and thought; as familiar as men in common life

are with the aspect or form of a fruit, or with the expression of a gentle or vicious animal. He had also closely observed the phenomena of lightning, and had noticed similarities which had never been thought of before. The wave-like sheet and the zig-zag line and the loud report were seen to be like the less impressive phenomena of the machine and the Leyden jar; and it occurred to his thoughts that the similarity of the phenomena indicated a common agent or power as their cause. This suggestion was strengthened by the thought, that clouds might be to clouds, or clouds to the earth, as the opposite surfaces of the Leyden jar. The mere observation of similarities like these might have satisfied the mind of Franklin, that the power or fluid in the heavens must be the same with that which could be accumulated by the machine from the earth. When at last he succeeded in bringing the power in question to affect a small quantity of matter, when he made it to run along an insulated kite-string, to emit a spark, to charge a Leyden jar—in short, to exhibit not only similar but the same indications with machine electricity, the induction could no longer be doubted. The decisive experiment proved the correctness of the thought.

Dr. Black was led to the discovery of *carbonic acid gas*, by observing that caustic lime increased in weight when changed into common lime, and by inferring that this weight must be derived from some agent of or in the atmosphere. This suggested the thought that the other alkalies, being like caustic lime in other properties, were like it also in this. The experiment was tried, and the suggestion was found to be correct. This put him upon the inquiry what the agent was which entered into combination with all these substances. The inquiry resulted in the separation of *carbonic acid gas* as a newly-discovered agent, and the determination of its properties and laws.

Lavoisier discovered that a metal, by rusting, gains in weight; and it being previously known that the phenomena attending upon combustion and the rusting of metals were similar, oxygen was discovered and its properties were ascertained. The most important step toward this result was made during the previous researches concerning *Phlogiston*, which had established the generalization of a common process in the formation of iron-rust, in acidification, in respiration, and in ordinary combustion.

Dalton is said to have discovered the law that chemical combinations are effected by the union of their constituent elements in fixed proportions; and that, when a larger portion of an agent, as oxygen, enters into such a combination, it is invariably a multiple of a smaller. He was led to this by the knowledge that, in some cases, a combination in such proportions had in fact been observed. Being a teacher of mathematics and accustomed to mathematical relations, he generalized the result of a few chance observations into a universal law; it "being irresistibly recommended by the clearness and simplicity which the notion possessed."

One of the most instructive instances of modern discovery, is that achieved by *Sir Humphrey Davy*, of the *metallic bases of the alkaline earths*. The similarity of appearance and of many chemical properties between such alkalies as potash, soda, and lime, and the clearly identified oxyds of metals, had led to the suggestion, that they were similar in chemical constitution—i. e., that they all were oxyds of metals. But the metals believed in do not exist in nature in a separate state, nor had they ever been exhibited in separate form by any agent of decomposition hitherto employed. The suggestion that there were such metals, and that they might be evolved, was confirmed by all the indications required as evidence, except their actual production. The application of the galvanic battery to chemical decomposition, and the triumphant success which had attended its use, led Davy to try it upon the hitherto intractable and irreducible potash. Under the solvent power of this wondrous agent, the knot which had never before been unloosed was untied in an instant. At the magic touch of this new instrument, the little globe of the newly-discovered metal leaped into view, and the *happy suggestion* was con-

firmed and accepted as an *undoubted fact*. It scarcely needed the experiment to convince the sagacious interpreter of the secrets of nature, that similar metals were encrusted within *common lime* and *soda*. The discoverer was almost as certain before as after the battery was applied, that *calcium* and *sodium* would in fact be evolved.

Induction of the identity of the electric and chemical forces.

The consideration that the electric agency could alone overcome combinations like these, in its turn started the suggestion that the union of all chemical elements is to be ascribed to the electric force, acting in certain methods and after certain laws, and that their tendency to unite is overcome by bringing these elements into an opposite electrical condition. This suggestion was tested by a great variety of experiments, with such results as to establish it as a truth beyond the possibility of doubt or question; thus bringing chemical laws and the electrical force into a most intimate relation.

The order of thought in these inductions.

§ 472. In the last series of discoveries we notice the following order and progress of thought and experiment. *First*, the oxyds of metals were observed to be like the alkalies in certain important properties. But the metallic oxyds were known to be produced by chemical changes; copper, iron, etc., constantly undergoing this process before our eyes. The two substances being alike in certain particulars, it was conjectured that they were alike in others. If the simple potassium had been within reach, or could have been found in a separate state, the readiest way to determine the point would have been to oxydize potassium, and see whether the result would be potash. The next thing was to *de-oxydize* it—i. e., to undo what nature was supposed to have done, or rather to separate the elements which nature was supposed to have united. This was accomplished by the agency of galvanism. It was then observed that this galvanic agency could decompose many chemical compounds which were exceedingly unlike, and it was suggested that possibly there were none which it could not overcome. If this were so, it would follow, according to the known laws of this agent, that the force which held them in union, must be electric. This was established by its appropriate evidence, and is called by Whewell, “the highest generalization at which chemical philosophers have yet arrived.” *Hist. Inductive Sciences*, B. xiv. c. 10.

The mental process is precisely the same which has been already described. Certain objects are seen to be alike in certain properties or laws. It is believed or judged that the similarity in these particulars indicates likeness in others. Potash is like iron-rust in certain respects; therefore it is like iron-rust in being the oxyd of a metal. All chemical compounds are strikingly alike in certain particulars. Certain of these are separable by the electric force; therefore all are separable by this agency. But if separable by it, all are held in union by the same force.

Discoveries theoretical astronomy. Co-pernicious.

From discoveries of this kind we pass to those in *astronomical physics*—to the discoveries of *Copernicus*, *Galileo*, *Kepler*, and *Newton*.

Copernicus begins by *discovering*, as it is said, the heliocentric theory of the solar system. The way in which he was led to adopt and defend it, is described by himself. He had found in ancient authors, accounts of Philolaus and others who had asserted the motion of the earth. "Then I began to meditate concerning the motion of the earth; and though it appeared an absurd opinion, yet, since I knew that in previous times others had been allowed the privilege of feigning what circles they chose, in order to explain the phenomena, I conceived that I also might take the liberty of trying whether, on the supposition of the earth's motion, it was possible to find better explanations than the ancient ones of the revolutions of the celestial orbs.

"Having, then, assumed the motions of the celestial orbs which are hereafter explained, by laborious and long observation I at length found that, if the motions of the other planets be compared with the revolution of the earth, not only their phenomena follow from the supposition, but also that the several orbs and the whole system are so connected in order and magnitude, that no one part can be transposed without disturbing the rest, and introducing confusion into the universe."

"Thus," says *Whewell*, "the satisfactory explanation of the apparent motions of the planets, and the simplicity and symmetry of the system, were the grounds on which Copernicus adopted his theory; as the craving for these qualities was the feeling which led him to seek for a new theory." *Whewell, Hist. Ind. Sciences*, B. v. c. ii.

Preparations for
the discovery of
Newton.

In 1609 *Galileo* constructed his telescope, and very soon discovered the satellites of Jupiter. This at once confirmed the Copernican theory, by opening before the eyes of men another system subordinate to the solar, of heavenly bodies revolving about their primaries, thus giving an analogon of the greater. The subsequent discovery by the same instrument of the phases of Venus, at once confirmed the new theory of the revolution of the planets about the sun, and answered an objection against it by explaining why Venus did not appear larger when nearer the beholder.

Copernicus furnished the suggestion by reflecting on the known fact, that the apparent places of objects may be accounted for by the motion of one or both, and that the solution or theory which was the simplest, was to be preferred. *Galileo*, by his telescope, prepared the way for the experiment, by enabling observers, in a certain sense, to observe for themselves, which moved—the sun or the earth.

Process by which
Newton came to
his induction.

Kepler prepared the way for the sublime discoveries of Newton, by his determination of the orbits of some of the planets, and the law of their motions. *Newton* had been himself familiar with the law by which, in obedience to terrestrial gravity, bodies fall to the earth's surface. The first thought which led him to extend this agent to the celestial bodies occurred to him in 1666, when he had retired into the country from Cambridge, in the twenty-fourth year of his age. "As he sat alone in a garden, he fell into a speculation on the power of gravity; that, as this power is not found sensibly diminished at the remotest distance from the centre of the earth to which we can rise, neither at the tops of the loftiest buildings, nor even on the summits of the highest mountains, it appeared to him reasonable to conclude that this power must extend much further than was usually thought. 'Why not as high as the moon?' said he to himself; 'and, if so, her motion must be influenced by it; perhaps she is retained in her orbit thereby.'" *Pemberton, View of Newton's Philosophy. Preface.* Upon this suggestion, he proceeded to the calculation of the deflection of the moon from a tangent to its orbit in a single second; it being assumed that the moon was at the distance from the earth which was then received. The result disappointed him; for he found that this deflection would be thirteen feet, which did not correspond with that required by the supposition that gravity deflected it. He laid his calculation aside for years. The subsequent discovery that the course described by a falling body is an ellipse, and that the distance of the moon from the

earth could be correctly ascertained, enabled him to accept his theory on the ground that it coincided with actual fact. The distance of the moon had previously been computed on an assumed but mistaken diameter of the earth. A more accurate measurement of a degree upon the earth's surface led to a correction of the distance of the moon, and Newton's theory was henceforward accepted as a demonstrated truth. He first conjectures that the extension of a known force from the earth to the heavens, is possible and rational. He asks, "if so" "*what then?*" following out his *induction* by a mathematical *deduction*. He then, by other mathematical calculations, tests this by a decisive experiment, and the conjectured agent is established as a *vera causa*, and its laws are carefully computed: the true theory of the heavenly bodies is forever settled.

Why inductions
in physics are
the most striking.

§ 473. The examples cited are sufficient to illustrate the nature of the inductive process and the assumptions on which it rests. They have been taken from the physical sciences, not because these differ essentially from those which concern moral and political subjects, but because they are better suited for our purpose. The objects with which they are concerned are more interesting to the majority of men. The effects of discoveries in them are more obvious. The experiments and observations which have led to them are more brilliant and startling. Many of their results are permanently fixed in the arts of life, both useful and ornamental. Some of them are continually brought home to our thoughts by engines and instruments which materially contribute to the convenience and comfort of man. The telescope, the prism, the quadrant, the hydraulic press, the steam engine, the galvanic battery, are all permanent memorials of what these processes have wrought, and they prompt to eager inquiries after the secret operations by which they were first constructed in thought.

Do not differ
from those of
common life.

The attentive consideration of these examples proves that induction in science is substantially the same process with induction in common life—that it is a process of interpreting indications,—in other words: of judging by means of discerned properties and laws that there are others which we have not yet discerned, and could neither notice nor know by direct observation.

Why are the inductions of science more difficult?

§ 474. This assertion would prompt the inquiries, Why, then, are the processes of common induction so easy and those of science so difficult? Why is the progress to common sense so easily and rapidly made in the infancy and childhood of the individual, and why have the advances of science been so difficult? Why so long delayed?—why, even now, is it true that in respect to so many branches of knowledge the race is yet in its infancy? To these questions the following answers can be given. It is important to consider the facts which they present, because they tend to throw important light upon the nature of the process of scientific induction.

The indications are obtrusive.

§ 475. We notice *first*, that in science, the properties observed, and which are the *indicia* or indicators of others, are less obtrusive than those used in common life, and are often

far removed from common observation. To be apprehended even, they require closer attention than men in common life are able to give.

If they were able to fix their attention upon them with success, they would not be willing to do it from the lack of that interest, that strong curiosity which is rarely developed and matured into a habit, except by special training in some school of art or science. Many of these properties can only be apprehended by some nicely constructed aid to the powers of sense, or some costly and ingeniously devised apparatus; to the production of which special inventive sagacity was required, which sagacity has itself been the fruit of many men or generations which have gone before. One instrument has grown out of another, or it has been slowly perfected in its constituent parts. Every such improvement has enabled the observer to perceive properties or to effect measurements which were entirely beyond the notice and the reach of the unaided powers of perception.

Require more discriminating observations.

§ 476. *Second*: The inductions of common life are founded on observations that are not discriminating. Those of science rest upon the sharpest analysis. The common observer observes facts and detects principles in regard to things or powers in the gross, either as they are combined or are worked in nature. He does not go far beyond the things and phenomena which the common necessities of life require men to distinguish, which things and results, in their constitution, are, causes and laws ordinarily more or less complex. The scientific observer continually aims to detect and separate, by a refined and acute analysis, powers and agents which are never divided except by artificial appliances,—and some of which are never parted even by these. Hence *the experiments of common sense* and *the experiments of science*, are very different.

Common sense observes the effects of objects and powers as they are brought together or divided by the manipulations of nature. Science parts and conjoins, in every possible method, with the express design of observing some effect, which effect shall, in its turn, decide some question of curious intelligence. Science often violates or intensifies some particular power or property, in order to consider it alone. She separates or accumulates in order that she may estimate or measure *gravity, electricity, light, or heat*. She becomes familiar with, and treats and talks of these as though they were distinct agents in the universe. It becomes in a certain sense true that the scientific observer creates a special and separate world of objects for himself.

The inductions of science more comprehensive.

§ 477. *Third*: Many of the inductions in science are far more general and comprehensive than those of common life. It is a fact of the universe of matter and of mind,—explain it or not as we may,—that these subtle agents or laws which science detects one by one, are far more general and extensive than those which observation discerns.

Of course they furnish the ground for more varied inductions. They can be applied to explain a greater number of individual phenomena. They suggest very many possible theories. They incite to a manifold greater number of experiments. When any such comprehensive power or attribute is established, it can be used in a large number of deductions.

The deeper we go beneath the surface we not only find things which are more novel than

the casual and practical observer notices, but we find things which are immeasurably better fitted for science, which seeks for comprehensive causes and general laws, that for this very reason are unifying and explaining principles.

Recognize mathematical relations.

§ 478. *Fourth*: Another fact must not be overlooked.

Many of these agents operate under geometrical relations, and according to arithmetical rules. They are thereby connected with relations which are at once the most varied in their application, and capable of the most definite description and computation.

The relations of space and number are capable of being affirmed of every material entity and force, and hence if any are found to exist and act according to such relations we have at once the ground or means of a very comprehensive generalization. The language of mathematics is the most precise and intelligible, the most easily communicated, and the most easily understood of all language. The tests of measure, weight, and quantity are the most easily applied of all tests.

The sciences of space and number are also capable of the clearest, the most convincing, and the most fruitful of deductions, and hence so far as they can be legitimately applied, they can most readily test experiments and record their results. One of the distinguishing peculiarities of scientific inductions is found in the circumstance that they are so widely, and severely *mathematical*.

One induction prepares the way for another.

§ 479. *Fifth*: Science is essentially more a growth than is any other species of knowledge. One discovery not only in

fact prepares the way for another in the actual history and order of man's attainments, but by the necessary dependence of one discovered law or agent upon another. The discovery of the law of universal gravitation was in the nature of the case impossible without the aid of *pure Geometry, Algebra, the Calculus, and the laws of Mechanics*. Optics, with the use and the invention of the telescope, had been in part developed before, and in part perfected by Newton, before they could be applied by him to this particular discovery. In almost every great induction, many of the sciences and arts are laid under contribution. All previous steps are presupposed in order that a single forward step may be taken.

This is true only to a very limited degree of the inductions of common life. The well-qualified and well-trained man can with no great difficulty develop of himself much that the race has ever gained by common sense and observation, or appropriate and master it with ease. In many things it is true the common sense of to-day in a refined and educated community in England or America appropriates the products which the common sense and experience of others have matured and preserved in language, traditions, manners and institutions; but all these are taken up by the mind with marvellous ease and require but little of that discipline, which the mastery of the circle of those sciences which are necessary for success, imposes upon the *discoverer*. There is very little difference between the common sense of Socrates and the common sense of the honest and independent observer of the nineteenth century, compared with the immense disparity in the amount of positive knowledge possessed by the student of Physics in Socrates' time and in our own.

These considerations we think sufficiently explain the differences which exist between the inductions of science and those of common life and

establish the truth that the process is substantially the same in each. The differences are to be accounted for by the difference in the subject-matter, and not at all by any difference in the process. The identity of the process is confirmed by the fact that common knowledge easily prepares the way for knowledge by science, and that what would be and often is common sense, becomes scientific sagacity when it is directed to and prepared for the study and interpretation of higher objects and relations.

§ 480. Induction in both is a process which combines an accurate and sharp *observation* of properties and a sagacious *interpretation* of what they indicate. But precisely at this point there presents itself the most interesting and vital of questions, 'On what ground or by what evidence do we proceed from the known to the unknown?' We can safely reply, it is not upon the ground of simple experience. Because all the rabbits which we have seen have been gray we do not for this reason believe that all rabbits are of this color. It is not simply from the constant conjunction in our experience of the attributes or properties, that we proceed to the belief in their universal and necessary connection in the constitution of nature. It is true that for a long time it was believed that all swans are white, for the reason that no swan of any other color had been observed or heard of.

"Mankind were wrong," says J. S. Mill, "in concluding that all swans are white : are we also wrong when we conclude that all men's heads grow above their shoulders and never below, in spite of the conflicting testimony of the naturalist Pliny? We have no doubt what is the correct answer to this question. But why are not men wrong in rejecting such a story, and in believing with assured confidence, that wherever men exist, their heads are not beneath their shoulders? Why is a single instance, in some cases, sufficient for a complete induction, while in others myriads of concurring instances, without a single exception known or presumed, go such a very little way towards establishing an universal proposition? Whoever can answer this question knows more of the philosophy of logic than the wisest of the ancients, and has solved the great problem of induction." *Logic*, B. iii. c. 3.

If we seek to answer this question, we say it is more credible or reasonable to believe that swans should vary in color than that men should vary so greatly in form. But why is it more credible? Some would deem it sufficient to reply that in most of the species of animals, individuals who are alike in every other respect differ in color, in other words, that it is the generally observed law that color is very variable, while the general outline or type of form is uniformly observed in every species, or at least has never admitted so monstrous a deviation, as would be implied in having the head beneath the shoulders. This would be Mill's answer to his own question, for in the last analysis or the ultimate solution, he makes extended observations and broad generalizations from observed facts to be the grounds of all Induction ; nay, he makes the belief in causation itself, in the uniformities of nature, and in the necessary truth of mathematical axioms to rest upon uniform experience. But this does not relieve the difficulty. It in no way explains why we believe the unknown will follow the uniformly known—why facts which have been generalized from the past must necessarily hold good in the future. In this particular instance, the solution obviously rests upon some other ground than that of mere observation. We assert with confidence, that it is not likely that a species of men should be so monstrously constructed. We cannot admit the supposition for a moment. The decisive reason is, that men so formed could not perform the functions of men with any convenience or success ; that such a form would offend both the eye and the mind, and would be entirely incompatible with the ideal of beauty and convenience to which we assume that nature would certainly conform.

Certain relations
a priori must be
assumed.

§ 481. Considerations of *convenience* and of *adaptation*, and even of *beauty* and *grace*, then, go far toward deciding the question. They give that weight and force to those "single instances which in some cases are sufficient for a complete induction," and detract all force from "the myriads of concurring instances" in other directions. It must be on the ground of such relations assumed *a priori* to be true of the whole universe of being and to hold good of its properties, powers, and laws, that we proceed in all our judgments of induction. These direct the mind in interpreting her indications. These prompt to the questions which we ask of nature in our experiments. These suggest the hypotheses by which we account for phenomena. These confirm all the theories which we finally accept as true.

Natural to ask
what truths are
implied.

§ 482. It will be in place next to consider, what are some of the truths or affirmations which the mind assumes in all its inductions, and by which it regulates its processes of inquiry into the properties and laws of the physical universe? We call these in the present stage of our discussion *assumptions*. We do not imply by the use of this term that they are not valid and true, but that we must believe in their reality and binding force in order to believe in what they imply. They are styled assumptions to show that they are logically necessary to the process when analyzed into its elements. We need not here inquire whether they are all ultimate and original to the mind. It may be that some of them may be resolved into others, or may perhaps be shown to be the results of a process akin to induction. It is enough for our purpose to ascertain what are some of the conceptions and relations which are *a priori* to the ordinary processes of inductive inquiry. Some of them are as follows:

Relation of sub-
stance and attri-
bute.

§ 483. (1.) All the objects with which the mind concerns itself in its inductions, are known as *substances* and *attributes*. It is with the properties or attributes of matter and mind as exhibited through phenomena that these inquiries are exclusively occupied, whether they are known as qualities, powers, or relations. Beings are known to the philosopher by their attributes or relations. It is by these, that they are distinguished, classified, and named. It is the first effort of the mind to know the attributes which are essential to every existing thing or agent.

When any new substances, agents, or elements are discovered, as *oxygen*, *hydrogen*, *aluminium*, *platinum*, etc., they are known to be new by certain special properties. In induction proper, viewed as the interpretation of indications, the *indicators* or *indicia* are always properties or relations observed; that indicated, or the *indicata* are properties inferred or believed. The form or the color of a fruit is the indicator: its taste, its nutritious or medicinal properties are indicated.

Relations of causation.

§ 484. (2.) Induction assumes and implies the reality of the *causative energy*, as necessary to explain the origination of every begun existence, and of all occurring phenomena.

Whether it investigates the powers of nature or the laws of nature, it proceeds upon this as a necessary assumption. A *power* in any being or agent is its *capacity to produce an effect* under appropriate conditions and according to definite laws. The power of heat to expand metals, of a burning body to explode gunpowder, of oxygen to corrode metals, of the soul to know objects knowable, and to care for objects desirable; all express and suppose one common relation, viz., the relation of *an energy that is causative of effects*.

That this relation is real, is assumed and implied in all our investigations into the unknown. This is true, if our inquiries respect the ascertainment of the unknown originator of a known effect, and result in the discovery of such elements as *oxygen* or *hydrogen*, or of such metals as *potassium* and *aluminium*, or of such agents as *gravitation* and *electricity*, or if we are still on the quest, and the cause or power sought for is not yet evolved. The same is true if our inquiries are directed to the determination of the *precise conditions* under which an ascertained cause produces a given effect, or the more definite statement of the relations—*mathematical* or otherwise—under which these conditions vary with a varying effect, as in the determination of the laws of gravitation, of chemical affinity, or of mental perception, association, desire, and volition.

The reality of time and space, and their relations.

§ 485. (3.) *Time and Space, with the relations* which they hold to extended objects and succeeding events, are also assumed in induction. So also is the possibility of the mathematical constructions which are conditioned by Time and Space; in other words, the reality and nature of *geometrical* and *arithmetical* quantities, their relations to one another and their varied applications to concrete objects and phenomena. These are not only assumed, they are put in the fore-front of the whole scheme of modern inductive philosophy. The processes of mathematical investigation are made the models for all scientific investigation. The results are the instruments of measuring all physical forces and of formulating all physical laws.

Gravitation was scarcely determined to be a force, till its mathematical relations were expressed in the law that it is a force varying inversely as the square of the distance. The laws of falling or projected bodies are expressed by means of the geometric curves in which they move, and by the numbers which describe their velocity. The pressure and flow of fluids are reduced to mathematical expressions. Chemical affinity is comprehended under the wide-reaching principle that different elements unite in definite numerical proportions, which has furnished the foundation for the modern chemical symbolization. The whole theory of astronomy is a combination of mechanics and applied geometry. Modern researches respecting light, electricity, and heat, have dared to propound the theory that all these are different modes of motion, the rates of whose vibrations determine these subtle and marvellously potent phenomena. They have at least demonstrated that the varying phenomena of these so-called forces or agents are attended by motions that can be made the test of their presence and the measure of their intensity.

Indeed so extensively have mathematical relations been applied in modern induction, that

it has been gravely urged on the one hand that spiritual phenomena and forces can in no way come under the inquiries of science, because, forsooth, they cannot be subjected to mathematical relations, or, on the other, that they can and must be subjected to these relations in order that any science of spirit may exist: in other words, that Inductive Science, or any kind of science of nature is possible so far only as the phenomena of nature can be brought under mathematical relations, and the laws of nature can be expressed in mathematical formulas.

That some properties indicate others.

§ 486. (4.) Induction assumes that properties and laws which are known, *indicate* and *signify other powers and laws*; that in these indications nature is honest and open in her dealings with man; in other words, that she is consistent with herself, or uniform in her methods of revealing or suggesting what man is prompted to interpret or explain. For example, we judge that a certain form or appearance in a fruit indicates a certain flavor; that a particular aspect of stem and branches signifies a habit of leaf and fruit; that a given expression of countenance betokens a peculiar disposition or temper in man or beast; that striking similarities of attributes in metals indicate a similarity in their being oxydized; that obvious and pervading similarities in phenomena prove that electricity in the earth is the same agent as the cause of lightning in the heavens; that the same power which is pervasive enough to affect bodies near the earth, is probably or at least possibly—in part or solely—the power which holds the moon in its changing path around the earth.

It is plainly supposable that these indications were not at all worthy to be trusted; that the same appearance which in one fruit indicates the bitter, in another indicates the sweet; that the expression and tones which in one man indicate wrath, in another manifest love. In like manner we might suppose that each class of objects, whether material or spiritual, appropriated certain signs which it shared with no other, so that the signs of oxygenation, or electric agency, in one species or sort, though uniformly observed within its own particular sphere, were not shared by any other. In the first case, we could not interpret nature at all, for every interpretation of the unknown by the known would be capricious, and we could not judge of a single individual by another. In the second case, we could not extend our judgments, though valid in one class, to any other.

The uniformity of the powers and laws of nature.

It is implied in the honesty or, which is equivalent, in the significance or interpretability of nature that she is also uniform, or self-consistent with herself from time to time; or in other words, that her laws and methods are permanent.

The same indications which she offers to-day she will use and follow to-morrow. The same laws which she reveals as established at one time she will conform to to-morrow, so long as the present system remains, or the reasons for sustaining it hold good. In other words, induction requires that we assume that nature will be constant and uniform in her agencies, operations, and laws; and in her methods of making these known to the mind of the inquirer into her secrets.

The alleged ground of such uniformity.

It might here be asked. Why do we believe this to be true? Is this assumption groundless and ultimate, or is it founded upon some reason? One reason might occur to us, that

otherwise we could not know or interpret nature at all. If nature were not thus honest and uniform, the human mind could have no knowledge except of individual things, or the knowledge acquired to-day could not be relied on for to-morrow, as in the meanwhile the operations and indications of nature might both be changed.

But it might still be replied, What necessity is there that we know and generalize? or more broadly, By what right do we presume that the objective universe is so constructed that the human mind may know it? We say, 'If it were not so, it would not be adapted to the mind. The mind would feel impulses and use activities which would find no corresponding objects. It would be impelled to modes of action in generalizing, interpreting, in explaining and forecasting, to which there would be no corresponding realities. It would find itself perpetually at fault, in perpetual disappointment and bewilderment. This is not supposable, such a constant failure of adaptation between the objective in nature and the subjective in the soul.' If this answer is appropriate or valid, it suggests another assumption, viz.:

§ 487. (5.) *Nature adapts objects and powers to certain ends.*

That adaptation
rules in nature.

In other words, physical forces are regulated and controlled by *design*. The application already made shows that this principle is assumed. It will be still more clearly manifest from the following examples. When Copernicus proposed to himself to try whether, on the supposition of the earth's motion, it was possible to find a *better explanation* of the revolutions of the celestial orbs than those currently received from the ancients, we ask what he would conceive to be a better explanation, and find an answer to our own question, in the reasons which led him to prefer his own. These reasons were, that his theory secured greater simplicity and symmetry to the mechanism of the heavens, and explained the apparent positions and motions of the heavenly bodies by a neater, a more easily conceived, a more symmetrical construction, than the older theory furnished. But why is a neater and more symmetrical theory to be preferred? Because it is *better adapted* to satisfy the mind of man,—because this mind thus reflects, were I to provide for the motions and appearances of the heavenly bodies, with given materials, viz., force, motion, etc., I should hold and move these bodies by the simplest possible arrangement of motions, and the most economical disposition of forces.

Newton, reflecting on the force of gravity, inquires within himself, 'Why may not the force which extends beyond the tops of the highest mountains also extend as far as the moon, and why may she not be retained in her orbit thereby?' His own question implied the answer: 'If this single force, known to exist, would explain the movements of the solar system, it is more rational to believe that this is the actual force than to adopt any other explanation.' This involves the assumption of a wise adaptation to the designed effects of the force or forces conceived to be at command. It is by a reference to the same assumption that we explain the general laws of philosophizing which Newton has laid down. The rule that real and sufficient causes of phenomena are to be taken to explain phenomena, whether it is or is not interpreted as coming under the more *general law of parsimony*, is only an enunciation of the truth that if an element, or force, already known to exist, can be employed to evolve, produce, or accomplish an effect, no new force will be provided or is to be supposed

If we ask upon what this assumption rests, we reply, that any other arrangement would be *bad economy—an unwise adaptation of means to ends.*

Two species of adaptation.

Thus underlying the entire structure of the inductive method we find the assumption of a twofold adaptation in nature, *first*, of the several parts or forces to one another, and *second*, of the indications of nature to the mind that interprets them. But if we assume that nature thus adapts her forces to ends and also that the human mind is competent to discern these ends and to interpret nature by her skill and success in wisely accomplishing them, we must assume—

Similarity of the human and divine intellect.

§ 488. (6.) That the human intellect in induction, judges the structure and adaptations of nature by referring to what it would itself consider to be rational and wise. In other words, induction assumes that the *rational methods of the divine and human intellect* are similar, and that the human intellect is therefore capable of judging of the principles and aims by which the universe was constructed and its laws can be known. More briefly expressed, induction is only possible on the assumption that the intellect of man is a reflex of the Divine Intellect; or that man is made in the image of God.

This will be made more apparent, if we consider more fully the rules of inductive inquiry, and the relation of experiment to theory.

The three rules of induction.

§ 489. The so-called rules or methods of induction are three: *The method of agreement, the method of difference, and the method of concomitant variations.* They are briefly stated as follows: (1.) If in all cases of an effect or phenomenon, one condition is uniformly present, that is the cause or includes the cause of such a phenomenon or effect. (2.) If, in any instance in which an effect does occur, one single condition is present, which is uniformly absent whenever such effect does not occur, this constantly present or absent condition is presumed to be its cause. (3.) If, whenever an effect or phenomenon is marked with peculiar energy, any condition varies with proportional intensity, this varying condition is the cause of such an effect.

These are rules for experiment.

Properly conceived, these are rules for testing or proving inductions, or rules for experiment: they cast no light upon that which is most essential in the inductive process. An experiment is a nice analysis or observation, made for an express design. Analysis, *i. e.*, discriminating attention, is the condition of all observation of qualities and causes. It begins with sensible perception, and without it, generalization and classification are impossible. The analysis used in induction differs from this only in being directed to those properties and laws which are less obvious, and often guides in a special search for those which the senses cannot directly detect, but which the mind divines

Relation of these rules to common sense.

The rules for this search are not different in fact from those which the simpler inductions of common sense and of common life require and employ. It is only because the relations upon which they are employed are less obvious, and the discriminations are more difficult, that these rules need to be distinctly considered and formally applied, and that the formal recognition of them by Bacon and Newton contributed so largely to the advance of modern science.

They presuppose an hypothesis or suggestion.

They are *methods of experiment*; i. e., as already explained, of *analysis*, with the design of testing a theory, hypothesis, or suggestion. These, from the nature of the case, must go before the trial. In the majority of instances the question must be put before the answer is elicited. The experimenter upon nature must come to her with his question formed and the answer anticipated, before he applies the methods of agreement and difference. Lord Bacon says abundantly that it is the *prudens questio*, or the wisely-suggested question, which directs the experiment to an anticipated result, and which very often predicts the result before it is actually established or proved.

What suggests the hypothesis or prudens questio.

§ 490. If now, *the question* suggests and guides the experiment, and if the anticipation predicts the fulfilment, we ask, *What suggests the question?* What are the grounds on which, or the methods by which the mind forms its anticipations? When, for example, Newton anticipated in thought the solution of the motions of the solar system by gravity, or Davy anticipated that he could bring out from the brown and earthy potash the brilliant potassium, what were the grounds upon which and the rules after which their minds proceeded? The question may be more generally stated: What are the conditions of successful *invention* and *discovery*?

Some say no answer can be given.

To this question many would reply, 'No answer can be given. The power to read the secrets of nature is a gift of nature. To think of the pertinent question, to apply the happy and decisive experiment, is a matter of individual sagacity, with which one person is more richly endowed than another, and the secret reasons or processes of which can neither be imparted nor explained. We know that it can be improved by exercise; that it can be formed and developed into *tact and skill*; but what are the methods by which exercise can form or mature it, is quite beyond the reach or power of analysis to trace out or describe.' There is some truth in this view, though not to the full extent of this representation. Analysis can at least separate and describe the essential elements of the process, and can so far describe the conditions of successful achievement.

The attention must be familiar with the objects.

§ 491. (1.) The first condition is, that *the attention be directed* to the class of objects and powers already known, which are to indicate and suggest the unknown. The discoveries of science are founded upon powers and relations which are overlooked by the great majority even of cultivated men. The sagacity which we seek to explain, is always exercised in respect to that subject-matter to which the discoverer has given special attention, and with the peculiarities of which he has become specially familiar. The chemical discoverer is a chemist. The discoverer in physics is a student of physics. As we have observed already, Franklin had become familiarly acquainted with

electricity and lightning by long-continued attention to the phenomena of both before he thought of their identity. It was not till Newton had meditated long and frequently on the forces of the universe, that he was in a condition in which it was possible for him to anticipate the theory of universal gravitation. Davy must, of necessity, be familiar with all the chemical facts already ascertained, in order to conjecture the unknown base of potash. It is plain, that if the philosopher is to interpret indications, he must first observe and attend to them.

It is almost superfluous to suggest that men differ in the original power and the acquired habits of attentive observation. These differences are apparent in respect to objects of universal interest and of common life. They are more conspicuous in regard to the mastery over the less familiar and less obvious objects with which science has to do. As attention and consequent familiarity are or are not attained, so is there present or absent the first condition of success.

§ 492. (2.) The objects must not only be attended to, but also *their relations*. The one involves the other. For the purposes of knowledge and especially of science relations are all-important. The relations most important to science are those of likeness or unlikeness leading to classification, the relations of number and magnitude which are the conditions of mensuration, the relations of causation and design which are employed in reasoning. These must be attended to, closely observed and familiarly considered.

In respect to the power of apprehending relations with facility and success, men differ greatly. In simple judgments of comparison one man discerns similar and dissimilar qualities, when another can discern neither likeness nor difference. Likenesses and unlikenesses of form are likewise detected by the quick eye of one man which can scarcely be made apparent to the slower and less acute observation of another. To whatever causes these differences of power may be ascribed, whether to a finer sensuous organization, or a more refined and discerning spiritual nature, the fact cannot be doubted that they exist. In discriminating causes and effects, in suggesting designs and ends, there are surprising differences in the acuteness, the quickness, and the comprehensiveness of the powers of different men. These are, in part to be ascribed to training and opportunities, in part to the interest or necessity which enforces the application and the energetic action of the powers, and, in part, to original aptitudes and capacities. It is not surprising that for observing those less obvious relations with which science is concerned, there should be still wider differences of capacity, both original and acquired, and that there should follow as a consequence most obvious differences in different persons in the familiarity attained with these special relations.

Both objects and relations must be familiar to the mind. § 493. (3.) The next condition of success is an *acquired familiarity* with the relations which exist between signs and things signified within any special sphere of observation or scientific inquiry. The florist marks indications in flowers which are unmeaning to other persons, and learns to connect them with what they indicate. The cultivator of fruits has the same experience with fruits. The sportsman alone learns by experience to understand the significance of certain actions of his game. The keen and discerning eye in every depart

ment is trained by what it is accustomed to, and gains some definite impressions in respect to the methods of nature in accomplishing her objects, and in indicating her powers and laws. The devotee of any special science soon gains a familiarity with the movements of nature within his own special sphere. He enters, so to speak, into her spirit.

The literal import of this language is as follows: The physicist and chemist, the botanist and geologist, become by degrees impressed with the conviction that some properties are far more prevalent than others; that they are very often present and manifest; that certain combinations of elements and agencies are, so to speak, favorites with nature. Certain powers are very limited in their application, and of course are manifest in a small number of phenomena. Others show themselves in a great variety of existences, and explain a vast number of phenomena. We need only compare gravity with its laws as universally applicable to all material things, and the law by which a certain compound of oxygen and hydrogen becomes explosive. Just as far as discovery or experience proceed, just so far do they mark off certain powers and laws as more, and others as less extensive. This is the simple result of experience often repeated in respect to a sufficient variety of cases; this experience matures into familiarity with what may be called the preferences, or favorite methods, according to which nature conducts her processes and manifests her powers.

It is obvious that in respect to the power of attaining familiarity of acquaintance with this class of relations by experience or observation, there is likely to be greater variety than in respect to acuteness of observation, energy of attention, or readiness of comparison. Men differ very greatly in respect to the insight which they gain into relations of this sort. The results are not of a nature to be expressed in language. There is no common vehicle for giving and imparting impressions of this kind. Hence greater original or acquired power to observe such relations, is esteemed more of an individual possession. It is regarded as a gift, a secret, an inspiration, an incommunicable and inexplicable attainment.

The constructive imagination must be employed.

§ 494. (4.) The next step towards discovery is the use of the constructive imagination. All the steps previously considered are steps or acts of experience. They are employed upon the facts already established by observation or tested by experiment. The act now considered is an act of mental construction or combination. It relates to facts as supposed, or conceived to be possible or probable by the mind. The objects, relations, and methods of nature being all mastered by quick and attentive observation, must be marshalled by the memory and placed at the service of the imagination to re-arrange and re-combine.

Let a complex substance be presented for that analysis in thought which precedes the test of experiment: or let some unexplained phenomenon be proposed to be accounted for. The first effort is to bring up in the imagination every known element or agent, and to ask which is more likely to be the one which we require. Or if none that are known will meet the exigency, what unknown element or agent—and acting by what laws—may be supposed to solve the problem.

To be able to answer these questions the memory must be quick to suggest all the powers and agents that are known in all the relations which we have considered. There is a vast difference in men in respect to the range and sweep and readiness of the memory when the memory is called on to give up its treasures; as we have had occasion to notice. But the presence or absence of a single essential fact may determine the question whether a discovery shall or shall not be made. The

The memory must be tenacious and ready.

failure to recall one single thought which might have been suggested, one actual combination of cause and effect or sign and thing signified, one more or less extensive and favorite agency or law of nature, may withhold from the judgment the very material which is essential to a sagacious conjecture.

To a successful issue it is not merely, perhaps not chiefly, essential that the mind be able to judge aright upon facts and data presented. It must have the capacity to think of them and to present them when they are wanted. Hence the greatest importance to the skilful inventor or the sagacious discoverer, of ready and comprehensive associations, or what is more usually termed a lively and productive fancy.

A quick and ready mind to recall and construct. Accident. Sagacity in discovery may be as much dependent upon the power quickly to recall one's knowledge or observations in the past as upon any other endowment or acquired power. The man of ready suggestions, the man fertile in expedients, the man quick in devices, is,—other things being equal,—the man who is sagacious and skilful in discovery and experiment.

It is not enough, however, that the memory suggests all that she has gathered, unless the imagination reconstructs and recombines in relations as yet untried and unknown. Here is the widest room for individual activity. The imagination takes all the materials at its command, all the powers and agents which are known to exist, with their laws and relations, and connects them with one another and with all known effects and phenomena in new methods. It makes these combinations for one sole end, not to amuse or entertain, not to explain or illustrate, not to convince, instruct, or to persuade, but simply to conjecture or devise what is best adapted to meet the exigency.

What is called *accident*, too, combines with memory at times to determine a great discovery in science, or a grand invention in the arts. The *Marquis of Worcester* happens to see the rising and falling of the cover of a teakettle, and forthwith he commences a course of speculation in respect to the laws of the agent which furnished the force; and thus sets in motion the course of discovery which has given to science and art steam power with all its applications.

Goodyear, the sagacious and persevering investigator into the properties and uses of caoutchouc or India-rubber, had long inquired after some agent in nature which would remove from the substance in question its special sensibility to cold and heat, and make it in effect a new material. He discovered this long-desired agent in the most casual way. "In one of those animated conversations so habitual to him, in reference to his experiments, a piece of India-rubber combined with sulphur, which he held in his hand as the text of all his discourses, was by a violent gesture thrown into a burning stove near which he was standing. When taken out, after having been subjected to a high degree of heat, he saw—~~what it~~ *may be safely affirmed would have escaped the notice of all others*—that a complete transformation had taken place, and that an entirely new product, since so felicitously termed *new metal* was the consequence." *Decision of the U. S. Commissioner of Patents.*

But thousands and tens of thousands of men had observed the same phenomenon which attracted the attention and excited the inquiries of the Marquis of Worcester. His previous knowledge of science and his familiar acquaintance with scientific relations alone enabled him

to turn this knowledge to a use of discovery. The promptness and range with which the associative faculty avails itself of such an incident decide the question whether it shall be received as a productive seed or whether it shall fall upon the barren rock or the parched sand. The eye of Goodyear was quickened by the watching and waiting of years to that sagacity which was able to see in the piece of refuse rubber casually discharged from the fire, an answer to the question with which his mind had so long been burdened.

A lively curiosity must be present.

The *curiosity* of the investigator is also a most important condition of failure or success, for it determines whether or not the intellect shall be effectively applied to the objects and relations which alone prepare the way for new knowledge. Perseverance and tenacity hold the attention and the memory to the question which may have been started; they task the memory to give up all its past acquisitions.

The peculiarities of character and of tastes which fit a man to be a successful investigator, act through the intellect, by giving it energy of action, and range of appropriate objects. The best stored and readiest memory can only furnish the materials upon which the mind is to act in judgment. The constructive imagination can only combine these materials after every conceivable method which promises aid or light in discovery. The most important step yet remains, and that is the act of framing an hypothesis, of constructing a theory, or of devising the question which may be most wisely addressed to nature.

A wise judgment must decide between hypotheses.

§ 495. (5.) This leads us to the judgments formed and preferences given in respect to the various possible suppositions which the imagination suggests or devises. The conditions previously described being all fulfilled, the materials being all provided and present, i. e., all the like and unlike substances and phenomena, and all the powers, properties and laws that could possibly be resorted to for the analysis or explication being marshalled by and before the imagination; the reason then judges which power or agency of all gives the most satisfactory solution and is most probably true.

By what standard.

But by what standard does it judge? What are the grounds of satisfaction and the tests of probability? The history of Induction shows that these differ in different cases. Sometimes the known existence of some agent or law or its very extensive prevalence in the economy of nature is the deciding circumstance in its favor. We always assume that nature works the most diverse effects by the fewest possible elements or forces. Sometimes it is what is loosely termed analogy.

We ask how close or near is the resemblance to the substance or event in hand. But likeness and unlikeness pertain to very different qualities and relations; sometimes to those which affect the senses immediately, as the eye and the touch, sometimes to those which are more remote from direct apprehension, as to mechanical or chemical effects or mathematical relations. Which analogies shall be decisive in such cases is determined by the importance attached to each in the general or the special economy of nature, or by what is called the congruity with her methods in similar departments.

The intellect appeals to itself.

§ 496. In the application of these and of similar criteria the intellect *appeals*, so to speak, *to itself*. The interpreter of nature continually asks himself thus: Given, certain elements, powers, and laws, how should I indicate them? or how should I apply them? Having followed certain methods of employing or indicating them in other substances and phenomena, how should I be most consistent with myself in producing or manifesting other agents and events? Or, in the reverse order: Given, certain ends, effects, and phenomena, which of the known forces at command would a rational being employ for this or that object, if he aimed at an orderly and intelligible, or a beautiful universe? Or, if no one of the forces known is adequate to explain the effects or phenomena, what unknown force or element is required to account for them, so as best to fulfil their objects, and what must be the properties and what the laws of such an agent?

The language so often used, that man is *the interpreter of nature*, that nature has her *methods*, her *economies*, and her favorite ways, implies that in all these judgments, there is a belief in the constructive or arranging processes of another mind. Even those who insist that we may not assume that there are ends or designs to be interpreted, constantly employ such language. But all inductive philosophers do assume this in their theories, their surmises, and anticipations; in every *prudens questio* which they propound. The more gifted acknowledge it distinctly, and assert that they commune with the spirit of nature, and that nature whispers to them often of her secrets.

§ 497. When Kepler exclaims, "*O God! I think thy thoughts after thee!*"—when Agassiz catches and repeats the same sentiment, in asserting that all just and *thorough classification is but an interpretation of the thoughts of the Creator*, they simply express in definite language the grand assumption on which every sagacious anticipation or happy theory is founded, viz., that the *rational methods of the Divine and human intellect must be the same*. This, of course, includes the assumption, without which the principles, maxima, and methods of the inductive philosophy have no meaning and no foundation, viz., that the universe of matter and mind has its ground and explanation in an intelligent originator. In other words, *Induction rests upon the assumption, as it demands for its ground, that a personal or thinking Deity exists*.

Who is the most successful interpreter of nature?

It follows that the most successful theorist and the most sagacious questioner of nature is the man who takes the wisest views of her indication by appropriate signs, of her economy in the use of given forces, and of her adaptation to the ends of harmony, beauty, and perhaps of beneficence; and who has been most accustomed to reflect upon the actual methods by which these various workings of nature are accomplished in varying cases, as in mechanical effects, chemical combinations, vital forces, and spiritual endowments. He is the wisest interpreter of nature, who through nature has entered most intimately into the thoughts of God.

§ 498. (6.) To success in induction, the power of *surmise* and *ready deduction* is also essential. The real nature and reach of any theory which is suggested by the memory or constructed by the imagination, cannot be understood until the most important consequences and applications are derived from it in the form of conclusions. The law of gravitation was no sooner suggested to the imagination of Newton, in the question, '*why not,*' and sanctioned by the approving answer, '*it is very probably true ;*' than the additional thought, '*if so, what follows,*' put him upon the act of deduction.

Whatever may be suggested or approved, whether it be the further extension of a power already known to exist, or the existence of an unknown agent, or the prevalence or the more exact determination of a new law, the deduction of the consequences that would follow is often indispensable to enable the mind to judge of the probable truth of the proposition which the mind entertains, and always to prepare the mind to compare it with actual fact. For it is obvious that not only the supposition itself, but the consequences which follow, must both square with the reality of things in order that the truth of the theory may in fact be established.

The power of wide-reaching, sure and rapid deduction, is an important element in the qualifications of the successful discoverer. A severe training in the discipline of the Syllogistic Logic, and the linked demonstrations of Geometry, as also in the subtle calculations of Numbers, is an admirable if not an essential preparation for success in discovery.

§ 499. (7.) Last of all comes the *experiment*, which tests the *theory*, however sagaciously it may have been conjectured ; which answers the *question*, however ingeniously it may have been proposed. Though we must assume that the methods of the divine and the human intellect are the same, yet we must concede that the elements and powers, the laws and methods of the universe, *i. e.*, the thoughts of the Creator, are, as yet, known to the created intellect only to a limited extent.

We may presume that those which are most obtrusive, perhaps that those which are the most general have been mastered by modern science, and yet must concede that we have not penetrated all the secrets of nature. Nor are we qualified to pronounce *a priori* upon what is true or false without submitting our judgment to the test of experiment. Even of the facts which have been observed and known we are not always sure that we have considered all in all their relations at the moment when our theory was constructed. We bring the judgments founded upon these limited data to the revisal of the Infinite Mind as he is manifested through his works. We question nature whether our thoughts correspond with her own. We revise and correct the answers which we have devised by the decided responses which our experiments elicit.

Experiment, as has been already defined, is another name for observation employed with a definite design. The design is usually to *try* or *test* whether our theory or suggestion is made good. The special rules or methods of experiment are, as has already been stated, no other than rules for a nicer and more careful observation than we ordinarily employ for the uses of common life. They hold the same relation to this observation which the employment of instruments and apparatus does to the use of the unaided and "unarmed" senses. They inculcate the necessity of look-

The capacity of ready deduction.

The experiment, its place and importance.

Relation of experiment to observation.

ing narrowly at every phenomenon, of measuring the force of every energy, of discriminating every shade of difference, and of separating carefully every element.

While, then, on the one hand, man, in constructing his wise questionings and in framing his theories, may claim a likeness to God; in submitting his theories to the task of experiment, he concedes his inferiority. Indeed, every act of experiment is a confession of human limitations. Rightly conceived, it is an act of reverent worship.

Lord Bacon's
eminent service.

§ 500. It was for giving prominence to this part of the inductive process that Lord Bacon has received such high and merited honor as the expounder of the inductive method. It was because he insisted upon the necessity of a constant and close observation of the facts of nature, and enjoined the duty of careful and reiterated experiments, as well as prescribed the rules and methods for prosecuting the same, that he was called the Father of Experimental Philosophy.

He did not overlook nor undervalue the other elements of the process which we have noticed. He recognized them more or less distinctly. There was no special need that they should be enforced in his own time. The Philosophy of the Schools paid sufficient homage to hypothesis, however much it may have failed to understand its nature or to analyze its processes. But experiments upon nature had not been understood, nor had it entered fully into the minds of men to inquire what were the rules for conducting them wisely and with success. It certainly had not at all entered into their thoughts to imagine or anticipate how much there was to be learned by this method, how vast a store of secrets was concealed for man's exploration, nor how the discovery of one property and law was to prepare the way for the discovery of another.

The anticipation of what was in store for man, through the wise application of the methods of experiment; and the confident and eloquent assertion of the splendid consequences which were sure to follow, constitute Bacon's special claim to distinction, and mark him pre-eminently as one of the most gifted benefactors of his race, and one of the greatest men of any period.

CHAPTER IX.

SCIENTIFIC ARRANGEMENT.—THE SYSTEM.

WE have already considered the several processes of objective or concrete thinking, and the products which they evolve. In other words, we have examined the processes which are usually recognized as being involved in the formation and the application of the concept or notion, viz., *analysis*; *generalization*; *classification*; *judgment*, in the two forms of *definition* and *division*; and *reasoning*, by *deduction* and *induction*—giving us, as their products, the *concept*, the *class*; the *proposition*; the *argument*; and the *principle or law*. It remains for us to consider, briefly, the combination of these several processes in a final result or *product*. The process may be called *scientific arrangement*, and the prod-

uct, *the system*. Most of the principles essential to this exposition have been so fully vindicated and illustrated in the preceding chapters, that we need only re-state them in this in brief propositions.

The simplest example of a system.

§ 501. Scientific arrangement or method may be defined in general, as the gathering of individual objects into a *synthetic* whole, by any one of the analyses and generalizations of thought. When any number of such objects are united into such a whole, that whole may, in a certain sense, be called a *system*.

Thus, even the smallest number of individual objects, when grouped as one product by being included under a single notion, may, in a certain sense, be said to be arranged into a *system*.

This is not, however, the usual signification of the term. We employ it in this sense simply to call attention to the truth, that the process of classification is the beginning of systemization. This is the first condition or step of the synthetic process which terminates in the system proper.

A notion applied in its content and extent.

§ 502. Inasmuch as every concept has the two relations of *extent* or *content* either dormant or developed, that arrangement of individual objects in *these two directions* which follows from the application to them of both the content and the extent of a notion is *more properly a system*.

When several notions of a more or less comprehensive *content*, or a more or less widely applicable *extent*, are used to define and divide the individual objects to which they apply, these objects are brought into a system; or the mind is said to take a systematic view of their several properties, and to class them as mutually related to one another. Their properties are seen to be more or less extensively the same; the classes in which they are grouped or gathered are said to be higher or lower, and the several classes are arranged into a hierarchy or a subordinated whole.

Inasmuch, also, as every concept results from, represents, and may be expanded into, its proposition; the propositions of content and extent express, when properly arranged, the systematic arrangement or method of the objects to which these propositions can be applied.

Notions which indicate permanent properties or laws.

§ 503. Every *concept*, as well as every proposition that respectively defines and divides and thus arranges and subordinates the objects to which each belong, indicates or suggests some property or power or law of the beings to which they are applied. Every *name* of a thing indicates that it belongs to some permanent class, and is possessed of properties that are fixed in the designs, and are perpetuated by the laws of nature. The most important propositions of definition and division simply expand and apply these permanent properties and laws.

When established by induction and applied in deduction.

§ 504. The less obvious but more important of these properties and laws are those which are discovered by *induction*, applied in *deduction*, and verified by experiment and observation after the methods and on the grounds which have been

explained. When so discovered, and applied, and established, they are used to explain or account for the less obvious events and phenomena in the universe of matter and of spirit. But the properties, principles, and laws which are thus inferred in induction, applied by deduction, and verified by tests of fact,—as they are respectively established,—serve to define and divide the beings and events which they concern, by notions that are constituted of more refined elements, and that divide beings into more comprehensive and significant classes. The principles on which *scientific systems* are founded, are more profound and wide-reaching than those which direct the classifications of common life.

Properties which explain and predict phenomena.

§ 505. Scientific arrangement and systemization,—the concepts and terms,—are applied with preëminent propriety to the methodical arrangement which is founded and effected by these *more recondite properties and more extensive laws*. Such properties and laws are said preëminently to *explain* the operations of nature, and to enable man to *predict* phenomena, as well as to control events and results by art or skill.

Scientific system more or less widely applicable.

§ 506. *Scientific method* or *system* may be applied to a narrower or wider range of beings or events, and may be founded on generalizations which are narrower and wider, or on inductions which are more or less profound. They may include a single kingdom of organic or inorganic existences, or may embrace all material things. They may define and arrange these according to the more obvious properties and laws which are open to common observation, or may employ those properties which appear to hasty observation to be very remote, and which are reached only by the most sagacious conjectures, and the most skilful experiments. They may include the domain of spirit only, or extend to the kingdoms of both matter and spirit, and arrange the two domains by the properties and laws which can be established as common to the two.

Systems of abstract concepts and rules.

§ 507. Systematic arrangement and scientific method are freely applied to *abstracta*, or those artificial products which are the creations of the human intellect; to those concepts which *law, ethics, theology, politics, and political economy* familiarly employ, as well as to those abstract forms and rules which *grammar, logic, and the mathematics* prescribe. But a system of terms, definitions, rules, and principles, when so applied, is always justified and defined by a reference to the concrete examples and existing beings, from which the concepts are derived, and by which the principles are tested.

The attempt has been made to arrange in systematic order and by a scientific method, the ultimate relations of knowledge itself; to subject to the subordination of higher and lower, of dependence and development, the original categories and first principles which make knowledge itself to be possible. Whether such an application of the desire for scientific method is possible, we are not yet in a condition to decide. We must reserve the answer to this question for our later researches.

PART FOURTH.

INTUITION AND INTUITIVE KNOWLEDGE.

CHAPTER I.

THE INTUITIONS DEFINED AND ENUMERATED.

HAVING finished, in Part III., the analysis of the *processes* and *products* of thought, we proceed to consider the *intuitions* or *original relations* which these processes assume to be real and make conspicuous in all their products. These are not peculiar to thought, but are essential to all knowledge whatsoever. They are, however, made obvious and prominent in the thought-processes. They are forced upon our notice by the analysis of these processes, and thus challenge our scrutiny. Inasmuch, too, as they must be generalized from all our intellectual activities, the consideration of them is properly deferred till they demand our attention. In conducting these inquiries we enter upon the *critical stage* of our investigations, at which the mind, having studied its operations in the way of scientific reflection, turns in upon itself, and inquires whether the relations which its scientific study assumes, are themselves trustworthy? whether, in other words, the human intellect may confide in the very operations which it is impelled to perform? This analysis is difficult, but full of excitement to all those who are fascinated with the inquiries that have to do with the mysteries of their being, and the grounds and limits of human knowledge.

Our first inquiries respect the general relations of these intuitions, and the methods by which they can be ascertained, etc., etc., as introductory to the consideration of them in detail.

Certain assumptions implied in induction.

§ 509. Our analysis of the process of induction has shown us that it involves several assumptions, viz.: the reality of the distinction of substance and attribute; of the causative relation; of time and space, and the relations they involve; of uniformity in the indications and operations of nature; and of the adaptation of the beings and powers of nature to certain ends. §§ 482-488. Upon these assumptions the entire process of induction rests, and upon their validity is founded its trustworthiness.

Also in the other processes of knowledge.

We have seen, also, that all the other processes of knowledge involve or imply more or fewer of these same assumptions. In sense-perception, we assume the reality of space and time, and the relations of material objects to space; and in consciousness, some relation of the psychical acts and affections to time and to the ego. In the varied forms of representative or reproduced knowledge, the reality of time is assumed as the condition of the relation of the representing to the represented object; whether the object is exactly transcribed or copied from the original, or whether it is varied by a creative process. In the various processes of thought or intelli-

gence, these same assumptions are implied. Without them, as we have seen, generalization, judgment, and reasoning would be impossible.

The very conception and definition of *knowledge* imply the same. Knowledge has been defined as the apprehension of being and its relations (§§ 48, 49). Also in the definition of knowledge. The possibility and the validity of the process suppose the reality of certain

beings, and the truth of certain relations. It implies, also, that there are certain relations to be known which are original, and the truth and validity of which must be assumed as the groundwork or foundation of all our knowledge. We may analyze what is complex, in both being and its relations, into what is simple. What is less, may be resolved into what is more general; but the relations which cannot be resolved into others, must be received as original axioms or assumptions.

§ 509. What these assumptions are, we are impelled to consider and inquire. Thus far we have inquired what are the processes and products of knowledge, when the power to know is employed upon its appropriate conditions or objects in the form of direct and objective activity. We are now to turn the power in upon itself; to inquire what are the relations which it intuitively discerns, and necessarily assumes. We enter upon the last and highest stage of our inquiries—which is properly called the *critical* or the *speculative*. We proceed to examine the power of knowledge, not for the purpose of ascertaining what it can perform or produce, but what its processes involve and assume, and to ask whether what are assumed may be trusted in themselves and in their applications.

This critical analysis of the power of knowledge is the last and highest form of the mind's activity, because it supposes the complete development and discipline of all the other powers. The mind must be trained to analyze every thing besides, before it can successfully analyze the processes and products of its own power to know. It must be able to explain every thing besides, before it can analyze and explain its own acts and products.

The special objects of the mind's knowledge in these critical or speculative inquiries, are the *relations* which the mind must assume in all its knowing. Their special and distinguishing features when thus generalized, are their *necessity*, *originality*, and *universal applicability* to all its knowing. (§ 529.)

We turn the power of thought back upon all the intellectual processes.

It is sometimes said that, in these inquiries, we turn the power of *thought* back upon itself, to ascertain and prove its assumptions and its laws. This is not technically true, if, by the power of thought, we mean only that higher capacity of the intellect which forms and applies general notions or concepts. More exactly we say, we turn the power of thought to the analysis and explanation of the power of knowledge in all its modes of action, by showing the ultimate or the most generic objects which it apprehends, and the ultimate relations or principles which it assumes as original and true. Of these it gives as complete a philosophical explanation as is possible. It inquires in respect to the conditions of their production; the order of their development and growth their relation to the concrete processes and products of the intellect, and, indeed,

of the whole soul; their mutual relation to one another; and, last of all, their trustworthiness as grounds of certainty and as criteria of truth.

Hence the critical examination of the power to know, involves a critical examination of the grounds and the trustworthiness of all knowledge and belief. It shows us that the relations or principles which we receive and trust as axioms in one kind of knowledge, are to be trusted in another. It shows us, moreover, that we are bound to believe and follow them wherever they lead us, because we cannot know any thing without them. It sets aside objections that are derived from the denial of these truths by showing that they are not only fundamental, but are always applicable. It disarms *skepticism* of every kind, whether it be *philosophical, ethical, or theological*, by showing that the relations which the human mind must apply in its lower knowledge, it cannot refuse to trust in their higher applications.

Relation of these inquiries to metaphysical investigations.

§ 510. These inquiries conduct us from the field of psychology toward and into the fields of both logic and metaphysics. It is not practically easy to draw the lines which determine the boundaries of each. It is certain that this analysis is, to a certain extent, appropriate to psychology, and that both logic and metaphysics are incomplete without the results which this psychological analysis gives.

Strictly speaking, we should say that, in *psychology* we are required to explain how we reach and how we use these cognitions, while in *logic* and *metaphysics* we are concerned with *what they are* in their definitions and relations to one another, and to all our knowledge. Inasmuch, however, as it is impossible to separate the analysis of a process from an analysis of its product, the psychological will often encroach upon the logical and metaphysical sphere.

It is certain beyond question, that, at a certain stage of the mind's development, these relations, in point of fact, become distinctly developed as separate products and objects of knowledge. Their origin must be accounted for. Their nature needs to be analyzed and explained. Their relation to the other processes and results which the mind performs and attains, must necessarily be unfolded, in order to attain a complete explanation of the powers, functions, and products of the intellect.

We do not learn the intuitions by the ordinary powers and processes.

§ 511. These ultimate facts and relations are not gained by the processes that distinguish the faculties of the intellect which we have thus far considered. Their truth and validity are not *apprehended by*, but they are *involved in* these processes. They are not perceived by sense-perception, nor felt by consciousness; they are neither reproduced in memory, nor represented or created by the phantasy; they are not generalized by the power to classify and name; they are neither proved by deduction, nor inferred by induction. They are developed and brought to view in connection with these processes, and are assumed in them all.

They have been referred to a separate faculty.

That they have been referred to a special and separate faculty or faculties is a fact notorious in the history of psychology and philosophy. This separate faculty or source of this peculiar knowledge has been designated by various appellations

as the reason, common sense, judgment, intuition, faith, the intelligence, the regulative faculty, the noetic faculty, ὁ Νόος as contrasted with ἡ Διάνοια, die Vernunft as contrasted with der Verstand. But while these truths have been so generally referred to a faculty under these various names, it has been as generally conceded that the word *faculty* is not used in its usual signification. Thus Hamilton observes (*Met. Lec.*, 38), the term "faculty is employed, not to denote the proximate cause of any definite energy, but the power the mind has of being the native source of certain necessary or *a priori* cognitions."

§ 512. The cognitions or beliefs themselves "have obtained various appellations." "They have been denominated κοινὰ προλήψεις, κοινὰ ἔννοιαι, φυσικὰ ἔννοιαι, πρῶται ἔννοιαι, πρῶτα νοήματα; naturæ judicia, judicia communibus hominum sensibus infusa, notiones or notitiæ connatæ or innatæ, semina scientiæ, semina omnium cognitionum, semina æternitatis, zopyra (living sparks), præcognita necessaria, anticipationes; first principles, common anticipations, principles of common sense, self-evident or intuitive truths, primitive notions, native notions, innate cognitions, natural knowledges (cognitions), fundamental reasons, metaphysical or transcendental truths, ultimate or elemental laws of thought, primary or fundamental laws of human belief or primary laws of human reason, pure or transcendental or *a priori* cognitions, categories of thought, natural beliefs, rational instincts, etc., etc." (*Ham., Met. Lec.*, 38).

Each one of these appellations could be easily explained, either by a reference to the nomenclature of some received philosophy, or by the obvious import of the words when applied to this subject-matter. Some additional names have been adopted by modern philosophers, in consistency with their general theory of knowledge.

Philosophers are generally agreed that there are certain conceptions or ideas that deserve to be called elementary or original conceptions, certain relations that are properly designated as fundamental, and certain propositions that take that place in our knowledge which is commonly assigned to first or necessary truths. But they are far from being agreed as to what truths deserve this preëminence. Nor are they in harmony as to the process or processes by which they are acquired or revealed, nor as to the conditions or occasions on which they are suggested to or discovered by the mind. Least of all are they possessed of clearly-developed opinions as to the relation which they hold to the knowledge which is acquired by experience, or is demonstrated by reasoning.

The language of many writers in respect to these principles is often eminent-ly vague and figurative, when it ought to be clear and precise. Often the imagination is resorted to for some bold and striking image, which vividly presents a sensuous picture rather than satisfies the intellect by a rational explanation of the problem. Such solutions are accepted by those who mistake the relief which is felt in passing from the cold shadows of attenuated abstractions into the warm presence of a concrete image, for the satisfaction which arises from a finished analysis or well-rounded synthesis of thought-elements and thought-relations. For these reasons the duty is imperative to attempt to give as clear and as well defined an exposition of these

The appellations by which they are known.

Difference of opinion in respect to these intuitions.

Described in vague and figurative language.

truths as the nature of the subject-matter will allow. In doing this, it is fully as important to distinguish them from what they are not but are sometimes vaguely conceived to be, as positively to assert what they are.

Relation of first principles to intuitions and categories. It will be noticed, that we make this question at first a question of first principles, or intuitive truths or beliefs, and not of categories or original relations. The distinction is purely formal. It is a matter of terms and not of thoughts, of language only, but not of things. As, however, the concepts and relations concerned are like all other concepts and relations given in the form of propositions or principles, and especially, as these in particular are almost always applied in this form, it seems more natural to treat them as such. It is true in this as in all other cases, that it is from or through a proposition that the appropriate concept is derived. The concepts of cause and effect and of causation, those of means and adaptation as well as those appropriate to extension and duration, are first gained through propositions. In this we have another example of the principle that a concept is a contracted proposition, and that the judgment is the norm of all forms of knowledge.

Not acquired
first in the order
of time

§ 513. I. We observe, then, that in calling them first truths or primitive judgments, it is not intended that these truths or judgments are acquired *first in the order of time*, or that the mind's assent to them is prior to its other acts of knowledge. That they cannot be acquired or assented to first of all, is evident from the unquestionable fact that, by very many they are never acquired at all. The majority of men never think of them, much less do they accept them. Even the majority who attain to not a little culture, do not reach a clear and intelligent conviction that these propositions are true.

Locke's discussion of innate propositions and ideas. It was forcibly urged by Locke that such propositions as "*whatever is, is*" and "*the same thing cannot be and not be at the same time*," cannot be innate, for the plain reason that men at their birth, and in all the early period of their existence are entirely incapable of understanding the meaning of the conceptions and terms of which these propositions are composed. If they cannot understand the constituent elements, much less are they capable of asserting that one of them is true of the other. This argument of Locke is decisive against any view of these propositions, which would make them *first, prior, or primitive in time*. It might be further enforced by the consideration, that the mass of men are incapable of that analytic abstraction which is necessary to detach the universal from the individual example in which it is realized. To be able intelligently to affirm that, *every thing that begins to be, must have a cause*; or that *a thing cannot be and not be at the same time*, the mind must separate being or causality from individual cases or instances of being or causative action—must be able to see in an individual thing, whether real or thought being—a case of being in general, and in any instance of combustion or explosion, the causal efficiency exemplified in an individual instance. It is easy to see that a man might assent to the truth, that this or that heated substance explodes a particular mass of gunpowder without distinguishing the one as *a cause*, and the other as *the effect*.

It is impossible that the propositions or their elements should be apprehended so early.

Or, if we concede or suppose that the causal attribute or relation could, by analysis, be distinguished from the individual example of *cause* or *effect*, an additional act of generalization would be necessary to qualify the mind to assent to the general truth, "*EVERY event must have a cause*." To do this the mind must extend its vision widely enough to take in all events, real and possible, in all places, far and near, through all time, past, present, and future, in order to comprehend the proposition to which its assent is required. But to such an exercise of generalization or comprehensive reflection, few men voluntarily or involuntarily raise themselves, and none at a very early period of life.

They are, in fact, attained last in the order of time.

These may suffice as reasons for the fact that these truths, instead of being the *first* to be consciously possessed and assented to, are the *last* which are reached, and by only a few of the race are ever reached at all. To reach them, long courses of training are required, to bring the intellect into a capacity for analysis and generalization, which may enable it to understand and assent to them. The mind must be exercised to some extent in philosophical studies before it can comprehend their import and application.

They stand first in logical importance.

§ 514. II. We observe that these truths or judgments stand first or before all others in the order of *rational* or *logical importance*. Hence they are called first principles: principles or truths *à priori*, as opposed to knowledge *à posteriori*.

Various significations of the term principle.

The term *principle*, which is so often used in this connection, is variously employed, and admits of many senses. It may be generally defined as any thing with which the mind begins in an act of rational or logical combination, or more generally still, as the constituent of any product of synthesis. The word *principium*, ἀρχή, is, literally, a beginning or starting-point. From this the transition is easy to the signification of that with which we begin; in this case, any thing with which the mind begins in its acts of connected or synthetic knowledge. In accordance with this generic signification, it is used in the following special meanings.

A constituent element called a principle.

1. Any *constituent element* of an existing thing, whether it is material or spiritual—whether it is a being, act, or product, is a principle. The materials which we put together, or think belong together so as to constitute any existing object, are sometimes called principles. In a similar way, the simple concepts that make up any complex concept or general notion whatever, are called principles.

A causal agent.

2. Any *causal agent* in matter or spirit, is called a principle, because the cause is looked upon as originating and beginning the effect. Thus we say of a machine, it has the principle of motion within itself. This use is not uncommon of the capacities of the soul, viewed as causes of a function or product. Thus, we say, there is a principle in man's nature by which he is able to distinguish truth from falsehood, or right from wrong.

A premise—especially the major premise.

3. Every *general proposition* which is admitted or used as a *premise* in deduction, is also a principle. However such propositions are derived, and howsoever they are supported by evidence, whether they are true or false, accepted or disputed, they are called principles when used as premises for deduction. The reason is obvious. They are so called, because the mind *begins* with them in the process of its reasoning.

Sir William Hamilton asserts, in his review of Whately's *Logic*, that "no logician ever employed the term *principle* as a synonym for major-premise." Whether logicians would or would not accept this as a proper technical appellation for a major premise, it is quite certain that those who have called themselves philosophers have so applied the term. The language of Bacon is in strict accordance with the doctrine of Aristotle in the following passages. "In syllogismo fit reductio propositionum ad principia per propositiones medias." *De Aug.*, lib. v. cap. ii. "Ars iudicandi per syllogismum nihil aliud est quam reductio propositionum ad principia per medios terminos." Cap. iv. "Numerus vero terminorum mediorum minuitur aut augetur, pro remotione propositionis a principio." *Ib.* Webb's *Intellectualism of Locke* pp. 42, 43

A truth or law
generalised by
induction.

4. All *generalisations* from *induction*, as well as all collected observations from experience, are called principles, for the reason that they are used to explain and account for the occurrence of particular events or phenomena. The mind begins with these in all its rational solutions. Hence the powers of nature and the laws of nature, as well as observed facts when generalized and supposed to indicate some concealed law, are freely called principles.

The ultimate
truths of any
science or art.

5. Those *general truths* which are the starting-points of the reasonings or communications of *any special science* or *art*, are called, with eminent propriety, principles; because, in imparting or demonstrating the science, the teacher begins with these as facts, or reasons from them as premises.

Hence the fundamental maxims or assumptions of mathematics, of logic, of law, of ethics, of politics and political economy, are called the principles of each of these sciences. In physics, also, the generalizations of Sir Isaac Newton concerning motion, etc., were called his first *principles* or great laws. So the leading truths or rules that are laid down as the guides of practice in any profession or art, are called the principles of that profession or art. For a similar reason, even the leading though not absolutely the fundamental truths of any science—the truths which are relatively comprehensive, though not the most comprehensive—are called principles; as the *Principia* of *Newton*.

Predominantly
concepts and re-
lations that are
ultimate in
knowledge.

§ 515. 6. But the appellation of principles is applied with preëminent propriety to any one of those *universal concepts and relations which are implied in any of the different kinds*

of knowledge. To know, is to be certain of being or existence in some form or relation. Any form of being, or any relation which is uniformly present or involved in any of the distinguishable kinds of original knowledge, is a principle of knowledge. It must be assumed or supposed as a beginning or element to make that knowledge conceivable.

Should we suppose that every possible kind or mode of knowledge were employed upon any single object, all these original or first principles would be brought into exercise. The exercise of the soul's completed knowledge would involve the application of each and all these principles.

When we turn the power of knowledge in upon itself in the way of reflection—when we analyze it into its elements, and generalize these elements into concepts, we discover the principles or elements which enter into the act of knowledge itself. As the nature and essentials of the acts of knowledge appear most clearly in their products, we find them most conspicuously in the products of these acts.

Again: As it is by the power and the act of knowledge that we can analyze the acts of knowledge, and so reach their essential elements, it follows that ultimate principles—these very principles for which we seek—must be implied and employed even in the act of discovering what these principles are. If this is a paradox in thought and seems a contradiction in language, it is a paradox which belongs to the very nature of reflection, and is implied by the possibility of such a power and its appropriate acts and results.

Again: The act of knowledge is an actual discernment of something that is—of being and its relations. Whatever the mind believes or knows to exist, that must be taken as real. The relations which it always finds realized in each concrete thing or act, must be taken as not only the principles necessary to our human knowledge, but as true in the reality of things. The reality of these relations in the world of being, must therefore be assumed to be implied in the place which the relations hold as necessary and fundamental to all our knowing.

The infinite and the absolute are principles.

7. If there are other objects of knowledge usually called *infinite* and *absolute*, which are necessarily implied in these special and limited relations, these preëminently deserve to be called principles, as they are in rational order and dependence *before*, and the explanation of, *all other objects of thought and knowledge*. Whether there are such, must be decided by our subsequent inquiries, and will be discussed in the appropriate place.

The relation of intuition to experience.

§ 516. III. These remarks explain the kind of priority which belongs to these truths, and the reason why they are properly so extensively called *principles, first principles, and first truths*. They lead us also to consider more particularly the relations which they *hold to experience*, and to the *knowledge* which is gained by experience. We have seen, in our previous analysis, that, while these truths stand *first in the order of thought*, they are *last to be reached* in the order of time. This implies that we are, in some sense, indebted to experience for their acquisition. It is equally clear that experience does not give them authority. Both these truths are expressed in the often-repeated proposition, that our knowledge of these truths is *occasioned* by, but it is not *derived* from *experience*. This is most happily expressed in a sentence quoted by *Hamilton* from *Patricius*; *cognitio omnis a mente primam originem, a sensibus exordium habet primum*.

Testimony of Leibnitz, Reid, Kant.

Indeed, the most sagacious thinkers coincide in the opinion, that our higher and *a priori* knowledge, while independent of experience as the source of its evidence and authority, is dependent upon experience as the occasion of its development. Thus *Leibnitz*, in criticising *Locke* for asserting that all our knowledge is derived from sensation and reflection, says: "The senses, although necessary for all our actual cognitions, are not, however, competent to afford us all that our cognitions involve." *Reid* also observes, in defence and explanation of *Locke's* real meaning: "I think *Mr. Locke*, when he comes to speak of the ideas of relations does not say that they are ideas of sensation or reflection, but only that they *terminate in* and are *concerned about*, ideas of sensation and reflection." *Essay*, vi. c. i. The doctrine of *Kant* upon this subject is uniformly as follows: "We must then first of all observe, that although all judgments of experience are empirical, *i. e.*, have their ground in the immediate perceptions of the senses, yet conversely it is not true, that all empirical judgments are for this reason judgments of experience, but in addition to the empirical element, and in general in addition to that which is given to sense-intuition, particular concepts must be furnished, whose origin is *a priori* in the pure understanding, under which every percept must be subsumed and so changed into true experiential as distinguished from empirical knowledge." *Proleg. ad J. Kant. Met.* § 18.

Testimony of Cousin.

Cousin also repeats himself abundantly in the following strain: "The idea of body is given to us by the touch and the sight, that is, by the experience of the senses. On the contrary, the idea of space is given to us, on occasion of the idea of body by the understanding, the mind, the reason; in fine, by a faculty other than sensation. Hence the formula of *Kant*: 'the pure rational idea of space comes so little from experience, that it is the condition of all experience.'" "Now the idea of space, we have just seen, is clearly the logical condition of all sensible experience. Is it also the chronological condition of experience and of the idea of body? I believe no such thing." "Take away all sensation; take away the sight and the touch, and you have no longer any idea of body, and consequently none of space." "Rationally, *logically*, if you had not the idea of space you could not have the idea of body; but the converse is true *chronologically*, and in fact, the idea of space comes up along with the idea of body." *Elements of Psychology*, translated by *C. S. Eklund*, chap. 2. *Cours de l'Histoire de la Phil. de 17e siècle*. Leçon 17.

Successor's time in which they are evolved.

But while it is easy to assent to these general truths concerning the relations of experimental to *a priori* knowledge, it is more difficult and yet more important to show precisely in

what form and by what successive steps these truths are implied in, and yet evolved from experience. Concerning the former, the way or method in which this knowledge is connected with our experience, we observe

(1.) These intuitions are apprehended in a *concrete*, not an *abstract* form. They can only be known as related to objects of matter or spirit, and never as independent of either.

They are apprehended in the concrete, not in the abstract.

The intuitions of substance and attribute ; of cause and effect ; of means and end, cannot be separately perceived by sense or consciousness, nor can they be pictured to the imagination as separate entities. They are only known and knowable as related to beings, and in connection with the beings to which they are related. The view that, because they are intuitions, they must necessarily be perceived apart, or by a faculty in any way analogous to a power of sense-perception, is only fitted to mislead the mind, and is wholly untenable.

(2.) The only form of language in which any act of primitive intuition is adequately expressed is the *proposition*. The subject of this proposition is the concrete object (of matter or spirit) which sense or consciousness apprehends.

They are best expressed in propositions.

We do, as it were, say, This is a *being*, *cause*, *effect* ; this is *long*, *short*, *before*, or *after*, etc. We have before seen that the proposition is the proper expression for all acts of knowledge. That this which is true of all the other modes of knowing, is preëminently true of this species or form of knowing, is obvious. All knowledge implies the apprehension of some relation, and is therefore an act of judgment ; one term of which is a concrete percept, or a conscious experience. But *this* knowledge is relational above all others, because it is invariably affirmed of a material or spiritual being. It must, therefore, be expressed in a proposition as its appropriate form of language.

It is not true, as is sometimes vaguely conceived and represented, that the mind finds itself in possession of primary conceptions, which it then *unites* or *connects* into first propositions or principles, but the original conceptions are given, as we have seen, in and through such propositions. This precludes the possibility, that the concepts or ideas should be furnished by one faculty—as the *reason*—and be combined in propositions by another faculty—the *understanding*. The true doctrine is, that the original propositions are analyzed so as to furnish the primitive ideas or notions.

(3.) The propositions in which this knowledge is first given or expressed, are not *general*, but *singular* propositions.

These propositions are singular, not general.

We do not set off with the universal beliefs or affirmations : *Every* event has some cause. *EVERY* THING SEEN or FELT is *extended* or *enduring*, etc., etc. But as we apprehend each separate object by perception or consciousness, we apprehend each as *caused*, *extended*, *enduring*, *adapted*, etc., etc., affirming mentally—i. e., knowing—this thing, seen or felt, is *caused*, *extended*, *enduring*, or *adapted*, etc. Cf. Cousin, *Psychology*, c. viii. ix. *Cours de l'Hist.*, etc., Leçons 22, 24.

(4.) From these propositions, as is true in all other cases, are derived the appropriate *concepts*. The concepts *cause* and *effect*, those of *means* and *end*, as well as those appropriate to extension, all appear originally as parts or constituent elements of propositions. From these they are derived. Into these several concepts, each of these propositions is contracted and condensed.

These propositions pass into concepts.

The condition of generalising these propositions and concepts.

(5.) Before these propositions and their concepts are apprehended and assented to as *universal* and *necessary*, the mind must turn in upon itself, and reflect upon what it does and what it discerns in all its processes of knowing.

In each of these processes it must analyze and distinguish the elements that are constant and essential. The fact that each is constantly *present in*, and essentially *constituent of*, these acts, is then apprehended and affirmed in those universal propositions which we call first principles and necessary truths. Neither the concepts nor the propositions are given to the mind as general notions or universal truths. They are found or discovered to be universally affirmable of all individual beings and acts. It is only by a critical or reflective judgment that the mind knows them as *universal*, *necessary*, and *primary*.

The several acts or methods of our knowing are reviewed; all its distinguishable kinds are brought before the mind. We are satisfied that, for us, or by us, no additional methods or kinds are ever exercised, and none can be conceived as possible. In each of these several kinds, the common element is generalized as the relation of *substance to attribute*; of *cause to effect*; of *means to end*; of *percepts to extension*; of *psychical states to time*. These are generalized into concepts, and receive their appropriate appellations, which, in some cases, are nouns, in others, circumlocutory phrases; but in all, serve to designate the always present and essentially constituent fact—*exemplified in the concrete instance*, and *generalized as the universal concept*.

Relation of these to other generalizations.

The singulars which we generalize in the case of these relations are, in some respects, unlike the sense-attributes which we generalize into their appropriate concepts. The similarity of these concrete relations is not, in all respects, comparable to the similarity which exists between concrete attributes; especially those apprehended by the senses. The generalized concept of a relation does not hold the same position with respect to its concrete, as does the concept of the singular percept. We do not generalize the concept *cause* from the singular cases of the causal relation exactly in the same way as we generalize the concepts *white* and *color* from the different shades of white, or the different species of color. The generalized relation cannot be directly *imagined* as is the generalized percept. If we attempt this, we can only image some individual percept, and then attach to it some other percept known by memory or pictured by the imagination as connected in such a relation. None of these relations can be imagined directly; they must all be indirectly and mediately pictured or illustrated, if they are pictured or illustrated at all. The readiest as well as the most satisfactory sensuous image or vehicle by which they can be discovered, illustrated, and proved, is *language*, which, in its words and phrases, constantly attests the presence and the indispensableness of these relations. To the language of men we go to find the indications that men believe in them. In language, also, we discover the traces of the various differences and combinations in which they are accepted and applied.

Stages by which they are developed.

§ 517. IV. The relation of this knowledge to experience being understood and kept in mind, we are prepared to attempt to indicate the separate stages of the process by which the knowledge of principles *a priori* is in fact developed and acquired. Of these *five* may be clearly distinguished.

First stage, the apprehension of the concrete object.

(1.) The *first* act or stage is the cognition of any *concrete object*, of which in the way already shown any attribute involving an intuition might be affirmed, or in which such might be exemplified. The object may be material or spiritual, it may be

a being or an act, as these are commonly distinguished. For example, it may be a fruit, a piece of marble; the combustion of wood, the explosion of gunpowder, the shooting of a star, the running of a horse; a remembered occurrence, a sally of imagination, a fixed purpose, or the ego that performs conscious acts.

It is conceivable that these and the like objects may be cognized for an instant, without the perception of any intuitional element or relation. Or should it be conceded that these cannot be apprehended apart for any length of time, the cognition of being comes first in the order of nature and of acquisition.

It is obvious also that all men in fact attain this first stage of knowledge. The prominent objects of sense and of spirit attract the attention of the whole race through those acts of perception and consciousness of which all are capable.

The second, of the objects as related.

(2.) The *next* step or stage is the apprehension of *these objects as related* in one or more given ways. The fruit is known as oval in form, as large or small in size. The color, taste, and feeling of the fruit are thought of it as qualities or properties. The combustion and explosion, the remembering, the imagining, are known as acts of the material or spiritual agent or as effects of which these agents are the causes; or as the ends to which other acts are adapted, or for which they are designed.

This second stage is reached by the whole race, not to the same extent or perfection in all, but so far that all may be said to achieve this kind of knowledge. Material objects are known by all men as long and short, round and square. Events are known by all as before and after. One object or act is known as the cause or the end of another object or act. The words which express and indicate the more familiar of these relations are accepted in the language of all men. They are spoken by all, and understood by all as signifying these relations.

Third the apprehension of the relation abstracted.

(3.) The *next* stage or act is when the relation is *abstracted from the beings* to which it belongs and is generalized into relations higher and more extensive, contemplated as separate entities. Thus long, short, etc., are contemplated as length or shortness; round, spherical, etc., are known as roundness and sphericity; past, present, and future are known as time relations; the power to produce this or that effect is abstracted and generalized as the causative relation; the fitness to accomplish this or that end is generalized and abstracted as the relation of adaptation.

This third stage is more rarely reached. For the common purposes of life men have little occasion to view these attributes and relations as separate entities, and still less to carry them to the highest degrees of generalization. Practical men have little need to consider or to speak of the relations of time and space or substance or cause, when separate from concrete objects and events, and when generalized in abstract language. Even thinking men, who may be well disciplined and practised in intellectual activities of other kinds, have few motives and little inclination to deal with such entities in their most abstract form.

The fourth, apprehension of the relation as fundamental.

(4.) The *fourth* stage is the critical consideration of the processes of knowledge, and the discernment of these *relations as essential elements in all these processes* and as the funda

mental principles which are implied in them all. It is manifest that this stage is reached only by a few, and by those only whose attention is directed to the critical examination of the intellectual processes, and to a speculative consideration of the principles which they involve.

There are but few who ever ask themselves what it is to know, what are the several modes or processes of knowing, what are the common elements which are always present in these processes, which can be analyzed in and generalized from them. Only a small portion of thinking men are trained to the habits of analysis and abstraction which are required for such critical and speculative inquiries. Fewer still raise any questions as to the ultimate and most general assumptions in the nature and relations of finite things on which the entire structure of our knowledge is sustained.

The fifth, apprehension of correlates.

(5.) The *last stage* or act of distinct knowledge is the recognition of *the correlates*, usually called *infinite* or *absolute*, which are required by these relations when they are generalized and reflected on in their completed import. Thus the relations of extension when apprehended as belonging to every material object, i. e., to the universe in its parts and as a whole, imply Space as their correlate; those of duration imply the correlate of Time; the universe conceived as a single effect implies a single causing agent—the universe conceived as a designed effect requires that this agent should be intelligent.

These correlates *Space, Time, and God*, are conceived as the conditions of the possibility of the universe, and the ground of its reality, and are therefore the first principles of every thing that is and can be known.

It is manifest, that if it be assumed that there are such correlates to these finite beings, the consideration of them as the real and the necessary principles of all beings is not within the reach of the majority of men for the reasons already given. It requires a capacity for the highest analysis and abstraction of which the human mind is capable. It supposes an interest in and a capacity for wider generalizations than most men exhibit. Few men attain to these ideas through processes that are purely speculative. Fewer can give the philosophical reasons by which they reach and on which they receive them.

All men may have the capacity to assent to truths concerning them when propounded in terms that are not philosophical, and enforced by reasons that are not abstract and speculative; but the number is exceedingly small who can analyze the processes by which they are necessary, or see their relations as the ground of all being and of all knowledge.

The fact that the recognition of these truths is the last attainment of the human mind is in entire harmony with the general law that the higher comes after the lower in the soul [Cf. Lotze, *Mik. B. i. c. iv.*]

Explains why they are distinctly known by so few.

§ 518. This review which we have taken of the several forms in which these truths present themselves, and the several stages by which they are developed to the mind's assent, serves to explain and confirm what has already been asserted in respect to these truths, viz., that though first in authority and in logical dependence, they are the last which are reached in the order of time; and that though all men manifest a practical belief in these principles, when exem

plified in the concrete, yet but few understand or assent to them when stated in a speculative form.

It also enables us to understand how it is possible that they should be discovered and tested in a variety of methods suited to the condition of each of these classes, as also why the criteria which satisfy one class of minds should neither reach nor convince minds of another class.

But what is best of all, it explains why the evidence for their truth and universal acceptance which is furnished by the *language* and the *actions* of men is more decisive and satisfactory than that which comes by speculative analysis or philosophical argumentation.

We have seen that all men reach the *second* stage of knowledge, so far as to apprehend many objects in one or all of these necessary relations to some other object, i. e., as substance or attribute, as cause or effect, as means or end, etc. Their recognition of these concrete relations, they express by their language in appropriate concrete terms, as by the *noun*, the *adjective*, the *verb*, etc., in their various forms of flexion and construction. The belief in their reality they express by their actions, their wishes and hopes, their sacrifices and their labors. Few men reach the *third*, and the number is therefore small who reflect upon the relation of causation when stated as generalized from individual instances, or ask themselves whether it is universal and necessary to the mind. Much less do they concern themselves with the inquiry whether this relation is an original principle or element in the processes of human knowledge. Such persons cannot understand these questions when they are propounded and discussed by others, because the conceptions and terms are strange and unfamiliar to their minds. Still less can they appreciate the arguments by which they are supported and the criteria by which they are determined.

And yet the very language which they use is a constant profession of their faith in the reality and importance of these relations. Almost every sentence which they frame and word which they employ is a voluntary acknowledgment, that these intuitions are necessarily accepted by all men. When they act, every one of their expectations and deeds is a more decisive avowal that these principles are absolutely certain, and never admit an exception.

§ 519. This review also explains how it can be that men may reject truths in theory which they admit in fact. In other words, it explains the apparent paradox that there may be truths which men always recognize in their actions, but deny or question when they are phrased as speculative or philosophical propositions.

Such propositions must always be expressed in the language of the Schools, that is in language which is *abstract* and therefore to a certain extent *technical* in its signification. They must be defended by appropriate evidence, the evidence that is appropriate in the schools; which often rests upon principles with which the mind is by no means familiar and is enforced by methods of reasoning to which it has not been trained or wonted. Again, many men who are unschooled and all who are schooled, are more or less possessed of and influenced by some speculative theories which they have caught up by accident or received by tradition from a venerated or a fashionable philosophical source. Such principles, traditions, and even fashions in philosophy constitute both the axioms and criteria of their accepted faith, and by these they measure and try every doctrine which they are called to consider. If such square with their scanty or their completed, their traditional or their studied philosophy, they receive them as valid and true; if they fail to do so, they reject them because they are inconsistent.

Recognized in
the actions when
denied in theory.

with the principles which they accept. But when these same faiths are required for their assent in language or in action, they present themselves in another form. They assent to them without hesitation, or rather they do not question them at all. They do not even recognize the possibility that they can be questioned by any one. They have spoken their belief by word or act without even knowing that any belief has been uttered.

We are justified in appealing from the philosophy of men to their words and actions. What all men inadvertently confess in their casual assertions, what they imply in the very forms of their language, what their actions unbiassed by their theories show that they recognize, what their expectations from others show that they believe that their fellow-men also accept, what is assumed in all investigations and reasonings without the attempt to give any reasons for its truth,—these are all taken to be or to involve universal and necessary truths of intuition, however difficult it may be to define them correctly, to reconcile them with the dicta of a received philosophy, or to show their place in any order of systematic arrangement.

But we are not justified for these reasons in neglecting the speculative treatment of these truths. Every consideration of a speculative character requires us to subject them to those criteria which are purely philosophical. These we proceed briefly to consider.

§ 520. V. The philosophical criteria of primitive conceptions and first truths are usually stated as three: *'their universality, their necessity, and their logical independence and*

Criteria.

originality.'

They are universal.

(1.) First truths are *universally* received. If they are not universal they can be neither necessary nor logically independent and original. But in what sense are they understood, and by what evidence can they be shown to be universal? Surely not in this, that all men actually assent to them when propounded in a scientific form and phraseology.

This as we have seen is from the nature of the case impossible, inasmuch as all men are by no means capable of understanding the terms and grasping the conceptions which enter into them. But all men can believe them in the concrete, in every individual case in which they are exemplified without knowing that they thereby exercise knowledge which when stated in its abstract form would involve the principles in question. Though they do not know this themselves, they may show it to others by the language which they employ, the actions which they perform, and the expectations which they cherish. These are sufficient to prove that certain truths are universally accepted.

First truths are necessary.

(2.) First truths are also *necessary*. Truths to be universal and primitive must be necessary, i. e., the intellect must be constrained by the constitution of its being and the spontaneous workings of its nature to receive them as true. It cannot know objects of any kind except under their relations and according to the connections which they involve. Should it attempt to do so or to prove that it does not employ and recognize them, it would make the effort of knowing without them, and of proving that it did not, by using these very relations in its efforts and its arguments.

When these truths are called necessary, the intellect is conceived as endowed with a permanent constitution working after certain laws, to uniform results. Should it be suggested that what may be necessary to one intellect may not be necessary to another, or that what

may be necessary to one order of intellects, *e. g.*, to man, may not be necessary to another order of intellects, *e. g.*, to another race or created order of spirits, it may suffice to answer that the grounds by or through which we make this suggestion and the argument by which we enforce it all presuppose the application and necessity of these relations for all who know, or to whom our knowledge affirms any thing to be true. If we attempt to destroy the grounds of human knowledge we must do it by means of the very relations upon and out of which this knowledge is constructed.

They are independent of other truths.

(3.) First truths must be *logically prior* to and *independent* of all other truths. Each one of them is the most generic concept of many similar individual relations. It can be itself resolved into no other, and can be proved by no other.

This is what Buffier must intend, when he says, "they are propositions so clear that they can neither be proved nor attacked by any propositions more clear than themselves." Hamilton means the same when he calls them *incomprehensible*, defining the term to signify, that of which we know the fact, but cannot give a reason. Hence they are called *self-evident* truths and *Intuitions*, because they need only be seen or apprehended to be believed. *The act of critical or speculative intuition* is not an act of sense-perception nor an act at all analogous, nor is it an act of memory, nor an act of reasoning in any of its forms; but an act of knowledge which is direct and original and is the necessary condition of all other acts of knowledge, preëminently of those which are the highest of all, *viz.*, the acts of thought.

They are not discovered by induction.

§ 521. It follows that these truths are neither discovered by induction nor generalized from experience. That truths thus acquired are worthy to be called principles in a very high and important sense has already been conceded. But it by no means follows that the truths which are principles in a sense which is still higher and more eminent are also derived from this source. That they are not the result of induction has been shown by the nature of induction as revealed in the analysis already given of the process. It has been shown that the process involves certain assumptions as true; or the belief of certain relations as original and self-evident. Unless we begin by assuming that these relations are valid and original, we cannot confide in the process of induction itself. Indeed, without these assumptions, the process can have no meaning.

That they cannot in any way be generalized from experience has been shown by the analysis already given of their relations to experience. J. S. Mill, in his *Logic*, contends most earnestly that all the so-called original necessary truths, including the postulates of mathematics, are derived by Induction through experience. The considerations already adduced are decisive against his theory. This will appear still more evident when we consider these truths more particularly.

"Man kann durch sie nie Grundsätze sondern, nur Lehrsätze einer theoretischen Wissenschaft erschliessen. Die Induction ist nicht der Weg zu den nothwendigen Wahrheiten, sondern der Weg zu der Verbindung der nothwendigen Wahrheiten mit den zufälligen Wahrheiten."

E. F. Apelt, *Theorie der Induction*, § 8, p. 58.

They are not
major premises
for syllogisms.

§ 522. Nor can they be regarded as the highest premises for comprehensive syllogisms, obtained by successive processes of regressively analyzing the premises or assumptions on which narrower syllogisms are founded. This view has been countenanced, if it has not been taught directly, by philosophers of very high authority.

Thus Dr. Reid says, "When we examine, in the way of analysis the evidence of any proposition, either we find it self-evident, or it rests upon one or more propositions that support it. The same thing may be said of the propositions that support it, and of those that support them, as far back as we can go. But we cannot go back in this track to infinity. Where, then, must this analysis stop? It is evident that it must stop only when we come to propositions which support all that are built upon them, but are themselves supported by none—that is, to self-evident propositions." *Ess. VI. c. iv.*

So Aristotle: "Ἡμεῖς δὲ φάμεν, οὐκ εἶναι ἀποδείκνυσι ἀποδείκνυσι εἶναι, ἀλλὰ τὴν τῶν ἀποδείκνυσι ἀποδείκνυσι καὶ τοῖς ὅτι ἀναγκαῖον, φανερόν· εἰ γὰρ ἀνάγκη μὲν εἰσιστῆναι τὰ πρότερα καὶ ἐξ ὧν ἡ ἀπόδειξις, ἰσχύει δὲ ὡς, τὰ ἀποδείκνυσι τὰ ἀποδείκνυσι ἀνάγκη εἶναι. *Anal. Post. I. 3; cf. I. 22. Cf. McCoish, Intuitions of the Human Mind, Part I. B. I. c. II. § 1 (8).*

To the same effect Buffler urges, "What is that which makes the little knowledge of which we are capable, so defective? It is that in the chain of our reasonings there are propositions at which our intellect stops, or respecting the truth of which others do not agree with us. These we endeavor to demonstrate; if our arguments do not convince, we adduce new proofs of these arguments. But in going up from proof to proof, we must at last reach propositions which do not need to be proved. * * * It follows therefore most clearly that there are propositions which it is not necessary to undertake to prove, but which it is of the last importance that we discern." *Traité d. prem. vér. Descartes, etc., § 6.*

It is, however, one thing to show that without first truths no deduction is possible, and quite another to show that such truths must be employed as the ultimate premises in our most comprehensive deductions. The analysis already given of the deductive process has shown that it rests primarily upon the relation of reason to conclusion, which in its turn rests upon the relation of cause to effect. It has also shown that the materials for deduction are all derived from induction or mental construction. First truths, or intuitive relations are implied as in one sense the support or foundation of the process of deduction, but not in the way of serving as its most comprehensive premises.

In their nature
cannot prove
any thing.

Were we to consider the process of deduction in its purely logical relations, we should clearly see that these truths could serve no use as premises. Nothing could be proved by such universal and wide-reaching propositions as *every event must be caused, etc., etc.* As soon as you interpose the minor, 'this explosion is an event,' you make no progress towards additional knowledge in the conclusion. You know already that this explosion was an event. In knowing it at all you had already decided that it was one of the things that are caused. Or more exactly, deduction as a logical process consists in the act of affirming [or denying, as the case may be] the predicate of a major premise of the subject of a minor by means of an intervening middle term. Let the major premise be 'all matter is extended,' and the minor be, 'electricity or light is matter' the conclusion would be 'light or electricity is extended.' Here it is argued you would have a convincing process. To this we reply, certainly, it would seem so, provided the minor were accepted or proved, but in proving that light or electricity is matter, you must prove that they possess the essential properties of matter, of which extension is one and is known to be one by intuition. From premises with predicates given by intuition there can be no progress towards any conclusion. The same fact may be stated more briefly thus: whatever is intuitively known to be true of each individual of the whole sphere or extent of a concept,

need not and therefore cannot be proved by deduction to belong to every such individual. Moreover, not a single example can be cited of a syllogism that proves any thing, the major premise of which is a first truth or a first principle.

For the purposes of deduction, all such principles are barren and useless. Nothing can be derived from them. From their very nature, they are simply statements concerning the relations or elements, that are present in every act of our higher knowledge. It is only because they are present as an essential and necessary element in all these processes that they must of necessity be conditions of deduction.

§ 523. VI. These intuitions or categories are in the strict sense of the term logically independent of one another. Their apparent dependence upon one another arises from the limits of the human intellect. These prescribe a certain order in the familiar acquisition of these concepts and in the frequency and extent of their application.

The observation is very common that by a logical necessity we must think of being before we think of its relations or attributes; of time before we think of space; of all these before we think of cause, and of these together with causation before we think of design: or, as expressed in other language; Being is fundamental to all the other categories, and must be presupposed before and as the condition of them all: and in a similar manner the less must precede the more dependent till the entire circle is complete.

This attempt to develop the categories from one another was carried to its extreme by Hegel, who began with *being*, and making being to be equal to *nothing*, i. e. to have no content, sought by what he called its *becoming*, i. e., the independent and necessary movement of the concept, to evolve all the categories from one another, not only of thought but of material and spiritual existence, in a self-completing and perpetually repeated circle. This self-evolved and self-completing circle of necessary concepts was conceived by him as the *Idea*, and all these together constituted the *absolute*, i. e. the sum total of mutually-related possible, and actually conceivable thoughts and things.

Hegel's mistake was twofold. He attempted to derive things from thoughts, or real from logical relations, instead of finding all logical, i. e., all *generalized* relations in those which are real. He attempted to derive one category from another, instead of explaining the apparent dependence of one upon another by the order in which they are developed to, and the extent in which they are applied by, the mind through its psychological limitations.

These categories cannot be developed from one another, for if this were possible, they would not be primitive and original. One cannot be explained into or resolved by another. None of them is properly complex, for if this were so, each of the constituent elements would be original and primitive, but not their constituted whole. They cannot be dependent in the relation of *content*, i. e., the import of one cannot be resolved into that of another. Nor is one more *extensive* than the other, so far as the real objects are concerned to which they may possibly be applied. Every object that exists must be conceived as existing, as diverse from others, as related to others, as whole or part, as in time and space, as capable of number, etc., etc. Were the mind capable of attending to all these conceivable relations of every existing object by a single intuitive act; were it not dependent upon the slow processes of observation and induction to learn which is related to which as *cause* and *effect*, *power* and *law*, *means* and *end*, these relations would be equally extensive in their application, and would all be co-ordinate with one another in the view of the human as they are before the divine mind. But inasmuch as the human mind proceeds in its knowledge step by step, some of these relations are far more familiarly and far more *extensively* applied than others. Some of them are applied to objects of imagination and thought, while others are more rarely affirmed even of things. The relations of dependence between them are therefore chronological and psychological rather than logical.

They are founded on the readiness with which they are acquired, and the frequency with which they are applied by the finite intellect of man, which can give its attention to but few objects at once; and to some objects more readily than to others.

§ 524. VII. The categories or intuitions may be divided into the *formal*, the *mathematical*, and the *real*. The *formal* are those which are necessarily involved in the act of knowledge, whatever be its objects—matter—whether they be real, imagined, or generalized—whether they be actually existing or purely mental creations. They are essential to the form or process of knowledge, and appear in all its objects or products. The *mathematical* are those which grow out of the existence of space and time and suppose these to be realities. The relations included under this definition are not exclusively used in the sciences of number and quantity, but inasmuch as they are fundamental to these sciences, we distinguish them by this epithet; using mathematical to designate all the time and space relations and those which are dependent upon them. The *real* are those which are ordinarily recognized as generic and fundamental to the so-called qualities and properties of existing things, both material and spiritual. We do not, however, by using the term *real*, imply or concede that the *formal* and the *mathematical* are any the less real—but that they are not limited so exclusively to objects really existing.

Why difficult to determine and classify them—

To analyze the categories into their ultimate elements, is confessedly not easy. Some that seem to be simple and ultimate, prove themselves, on a closer inspection, to be complex and derived. To arrange them in a satisfactory classification is, if possible, still more difficult. The principles by which, and the starting-point from which, such a classification may be conducted, are various, and are far from being universally agreed upon. Should our attempt be only partially successful, it may yet further the ends of truth by its partial success, and its partial failure, as the first is approved and as the second provokes criticism.

The problem is, to determine what relations and concepts are original, in the sense of being incapable of being interchanged with and derived from, any other. The difficulty of solving the problem is greatly increased by the circumstance that the same original continually appears and reappears under different names; the difference in the terms being owing, in part, to merely linguistic influences, and in part to the combination of the original with some other element, giving a complex notion, in which the category is prominent. In other cases, the element in question is disguised under a term in which its purpose or use is most conspicuous. Thus, the category of being signifies *generic* or *thought-being*, *real being*, *an existing*, i. e., *individual being*, *substance*, etc., and the relations of causation are more or less conspicuous and yet variously applied in the terms *power*, *efficiency*, *capacity*, *faculty*, *quality*, etc., etc.

The principal categories and intuitions may be determined by a reference to the several acts and objects of knowledge which have come under consideration in the preceding analysis of the powers, products, and processes of the human intellect. In this analysis we have sought to recognize all the objects and relations involved, and the review of it will be likely to suggest the most important.

§ 525. The *formal* categories have been defined as the generic conceptions and relations which are involved in every form or kind of knowledge. We call them formal because they are present in every act of knowing, whatever be its conditions or objects. These essential and always present relations will not, of course disappear when the real relations present themselves which are do

The formal categories.

rived from the objects known. They must perpetually appear and reappear in connection with these, whether they are recognized or overlooked.

It will be observed that these are not formal in the sense in which the term is often applied, *i. e.*, as pertaining exclusively to *logical* or *thought-knowledge*. They are present in all the forms of knowing, in consciousness, sense-perception, and representation, as truly as in the technically called *forms of thought*. Thought generalizes them, and hence, even when they are spoken of in perception and consciousness, they are presented to the mind as concepts, and thus involve the relations of concepts to concepts, as well as the relations of things to things.

Knowledge, in all its forms, has been defined as the apprehension of being. Every thing known is known as a being (§ 48). The concept of *being* is coextensive with knowledge, and is therefore fundamental. But in knowing, we not only apprehend *being* but beings as *related* (§ 49). *Relationship* or the condition of being related, is a concept which is as truly involved in every act of knowledge and is equally extensive and original with *being*.

But in knowing being as related, we must *distinguish* beings from their relations—*i. e.* knowledge involves analysis (§ 50), and thus requires the condition of being distinguished, *i. e.*, *diversity* in objects known, and that this should be as extensive as the act of knowledge. Not only is *analysis* present in every act of knowledge, but *synthesis* also. But *union* and *separation* involve products in objects related as *wholes* and *parts*.

One being is distinguished from another being and one relation from another relation, as truly as one being is distinguished from its relations. The relation of *diversity extends to beings and relations*.

But again: when beings are generalized they are united, *i. e.*, brought into a whole, by means of *common*, *i. e.*, similar, *relations* (§ 890). They cannot be described in language or defined in science, except by means of their characteristic relations. They are known and knowable by these common properties. Not only is every being known by its distinguishing relations, but they are still further known in their classes by the greater or less number of relations which are common and peculiar to each, *i. e.*, by being combined in class-concepts, which are more or less comprehensive. *Distinguishability* by relations, enters very largely into our knowledge. It is present as extensively as generalization or the use of concepts. This gives us the so-called category of *substance and attribute*, as at least coextensive with the act of knowledge by concepts. But the concept, in its double relation of content and extent, involves *logical analysis and synthesis*, with *logical parts and wholes* as their *products*.

Diversity again involves the relations of *identity*, in the double form of *real* and *logical identity*, according as the object-matter is a *being* known to be identical with itself, or as it is a *concept* regarded as identical with its elements.

§ 526. We pass from *the act* to *the objects* of knowledge.

The mathematical or logical essence.

All the beings which we know are either material or spiritual.

The distinctive relations of each are manifold, as we have seen; but those most generic and universal are their time and space relations. All spiritual beings and phenomena are enduring or time-requiring. All material beings and phenomena are extended, or space-occupying, and indirectly time-filling. These relations are coextensive with these two

kinds of being, and hence are said to be characteristic of them, as existing or real objects.

It is by means of space-relations that we connect together the several precepts that are given by the separate senses into material wholes or things. These material wholes we divide into smaller spatial limits, or we can enlarge them by extending their limits and adding to their substance, thus making *material wholes and parts* by the *analysis and synthesis* that is essential to all *sense-perception*.

By the time-relations we connect the several states of the soul which we experience in consciousness as coexisting and successive, and affirm the continued and identical existence of the soul itself; making wholes and parts of its activity, as we are conscious of the soul as one existing being in many acts or states.

Time and space relations are eminently *individualising* relations, inasmuch as the individual objects of sense-perception and consciousness are known as limited to certain time and space relations, as *now and then*, *here and there*, or as still further limited by the combination of the two—the observer occupying a given place, or existing at a given time when he is respectively *conscious of a psychical state as now or then*, or *cognizant of a sense-object as here or there*. This is equivalent to the use of the definite articles *the, this, or that*. But again, these relations may be *generalised*, and so express *size, form, situation, and direction*, the *present*, the *past*, and the *future*, and so be applicable to a great variety of material and spiritual objects.

The most striking scientific use to which they are applied is when the ideal relations of certain products of the constructive imagination are generalized, and the various concepts of magnitude and number are the results, with the relations which they involve. These give us another species of thought-*wholes* and thought-*parts*, which are the representatives and symbols of the various species of *quantity*. It is for their important service, and their ready application to these uses, that time and space relations are called by eminence the *mathematical relations*.

Time and space relations also render another important service. All spiritual phenomena, and all thoughts, i. e., intellectual concepts and relations, must of necessity be set forth by analoga which are founded on sense-objects or sense-images, i. e., on objects and images borrowed from the material world, and holding relations to both space and time. That is, the concepts proper to all these words, must in some way or other be constructed of elements which, in the ultimate analysis, are derived from properties or relations that are imaged in space and time. The most abstract terms in every language—the terms for the very categories themselves, as *being, diversity, relationship*, even for *time and space* themselves—will be found to be derived from such images, or to suggest them. The universal attendant upon all phenomena, whether material or spiritual activities, or their products, is *motion*. Hence, *motion* is used so largely in the construction of all concepts, and the importance of motion, as the one category that is in a sense common to all the rest and the agent by which beings and their thought-relations are conceived by the mind. But *motion* implies both *space and time*, the concepts of which it enables us to construct, and which, in its turn, it helps us to reason of, and to define. (Cf. A. Trendelenburg, *Logische Untersuchungen*).

The real categories.

§ 527. The remaining class of relations is the *real*, the so-called qualities, properties or powers of existing material and spiritual beings. These are reducible to two, viz., *causation*

or the capacity to produce effects; and *adaptation* or the fitness to accomplish certain designs or ends.

The *first* is generic to all material and spiritual properties and powers. Every thing which we call a sensible or spiritual quality in nature requires and supposes the fundamental relation of *cause* and *effect*. Every such quality when affirmed of a being is but another name for its causative power to produce such and such an understood or assumed effect. Even spatial motions are conceived by the spatial relations which they involve or bring to view, as causal capacities to produce or effect certain mathematical constructions, and thus in a certain sense to come under the category of causation. We extend the same relation to the *properties* of *abstracta* or the mental entities which are formed by abstraction and generalization. These causative relations furnish the most important materials for the analysis and definition of our concepts of material and spiritual things, and for the arrangement of them into classes. The so-called *powers* of matter and *faculties* of spirit are causal capacities; the conditions to the actual exertion of this causal force being called their laws. These conditions are most conspicuous in those laws of material forces which are found in those mathematical relations, the value of which has been so amply illustrated in the progress of physical science. The elements into which *analysis* and preëminently scientific analysis seeks to resolve all material and spiritual agents, are their causative energies.

But when science combines these elements which it has separated, for the rational use or interpretation of nature, it recognizes the *second* generic relation, viz., the relation of *adaptation*. It does this when it itself combines together several agencies for the designed production of an effect, or when it interprets a result which it finds in nature by the combined activity of the agencies which it knows are fitted and it believes were designed to effect it. As by analysis we separate the several causative elements of an object, and in so doing, turn the mind in different directions or aspects in order to view the object in its relations to every other, so by synthesis we bring these elements together when we view them as forming the designed or permanent essence of the object before us. We do the same when we regard several powers of different beings or several beings as acting together to accomplish any effect for which they are essential. It is by the relation of adaptation in certain powers in nature to certain designs of nature that we explain the permanence of individuals and classes. It is by the adaptation of the powers and laws of the objects which we know, to the impulses and operations of the knowing mind, that we explain the endurance of the laws of nature. It is by the same consideration of adaptation that we confide in the harmonious action of the powers of nature and the stability of her structure; that we rely upon the trustworthiness of her indications, or believe in the development and progress of the Universe. It is by adaptation that we connect the parts of the universe into a *finite* system or whole or find the best solution of its being and its order and interpretability in a self-existent and personal Intelligence.

CHAPTER II.

THEORIES OF INTUITIVE KNOWLEDGE.

- A COMPLETE sketch of the various theories which have been held in respect to the nature, origin, and authority of primitive notions and intuitive judgments, would involve the most important portion of a complete history of *Metaphysics* or *Speculative Philosophy*. Such a sketch would be entirely out of place in the present work, and will not be at

tempted. We shall only endeavor to group and critically examine, under a few comprehensive titles, those theories which have any present interest for modern thought, or which are still maintained in modern schools of philosophy.

§ 528. 1. It has been extensively taught and believed, that these original ideas and first truths are discerned by direct insight or intuition, independently of their relation to the phenomena of sense and spirit. The power to behold them is conceived as a special sense for the true, the original, and the infinite; as a divine Reason which acts by inspiration, and is permitted to gaze directly upon that which is eternally true and divine. The less the soul has to do with the objects of sense the better—the more it is withdrawn from these, the more penetrating and clear will be its insight into the ideas which alone are permanent and divine. Such are the representations of *Plato*, *Plotinus*, etc., among the ancients. Similar language has been employed by many in modern times who have called themselves Platonists. Platonizing theologians have freely availed themselves of this phraseology and have seemed to sanction the views which this language signifies. Thus the Platonizing and Cartesian divines of the seventeenth century, as *Henry More*, *John Smith* of Cambridge, *Ralph Cudworth*, and multitudes of others, freely express themselves. Philosophers who Platonise in thought or language have adopted similar phraseology; some have even pressed these doctrines to the most literal interpretation. *Malebranche*, *Schelling*, *Coleridge*, *Cousin*, and others, have allowed themselves to use such language and have given sanction to such views more or less clearly conceived and expressed. Those who combine with philosophic sentences, the power of vivid imagination and of eloquent exposition, not infrequently meet the difficulties which attend the analysis and explanation of the foundations of knowledge, by these half-poetic and half-philosophical representations.

Whatever may be their real meaning, it is manifest that the representations which they give are not true when literally interpreted. It cannot be successfully, scarcely soberly maintained, that these ideas and truths are discerned by the mind out of all relation to actual beings and concrete phenomena. It is so far from being true that the mind needs to be delivered from, or to look away from the sensible in order to discern the rational, that it should always be remembered, that it is only by means of the sensible that permanent principles and relations can ever be reached. No direct inspection of primitive ideas and principles is conceivable. It is not by withdrawing the attention from, but by fixing it upon the facts and phenomena of the actual world, that the truths and relations of the world which is ideal and rational can be discerned at all.

If we put a more sober as well as a more charitable interpretation upon the language in question, we shall be safe in asserting, that when this class of writers require that the intellect should be withdrawn from the sensible in order that it may discern the rational, they mean only that the mind should disregard what is peculiar to the individual, and consider those attributes and relations which are necessary and universal. When they insist that there is in man a special sense or insight for the supersensual, they intend that the mind cannot avoid contemplating the higher relations of sensible and transitory objects.

§ 529. 2. Many of the earlier philosophers and theologians of modern times, following the Scholastics of the middle ages, were accustomed to say that these ideas and truths are discerned by the *light of reason* and the *light of nature*, or that they are evidenced or evinced by their own light. The use of this language is in part to be traced to the often-repeated maxim of Aristotle that some truths cannot be demonstrated, but must be accepted without proof; in part by a Platonic interpretation of the passage in the gospel of John (i. 9), in which the *Word* is said to enlighten every man who cometh into the world.

Whatever may have been the origin of the phrase, the fact is undoubted that, before the critical investigations were introduced by Descartes which led to the modern psychology, these primitive ideas and primitive truths were generally said to be discerned by the light of nature.

It is obvious that the phrase is figurative and expresses only the fact which remains to be explained and accounted for, that these truths are neither generalised from experience nor deduced by logical ratiocination; that they are no sooner thought of than they are assented to, and that upon them as original assumptions rests the validity of all generalisation and deduction.

The following account of the *lumen naturale* is taken from the *Lession Philosophicum* of *Chauvinnus*. Rotterdam, 1692. "Hujus modi autem lumen humane menti convenire ex eo confici potuit, quod eadem humane insit, tam ea, que vulgo appellatur intelligentia, sive habitus primorum principiorum, quam lex naturalis; que certe nihil aliud esse posse aiunt quam predictum lumen naturale."

"Insit quidem humane menti cum intelligentia, tum lex naturalis: illa quæ generalium quarundam propositionum ad quas, velut ad primam scientiæ normam, omnes disciplinarum omnium demonstrationes revocari possunt, ut impossibile est idem simul esse, et non esse; totum est sua parte majus; hæc quæ boni faciendi, malique vitandi, ut homines vivere, neminem ledere, suum cuique tribuere, mens humana, nemine mortalium docente, et concessa et persuasissima est. Sed utraque illa mentis humane qualitas est LUMEN NATURALE; et quidem utraque est informatio nostræ menti à Deo, et de Deo ingenua, nullum unquam finem habitura. Hæc autem sententiam impugnant alii." *Of Notions Communes*. Chauvinnus *Lex. Phil.*

That they are innate or innate.

§ 530. 3. The doctrine has been earnestly held and taught that these ideas and beliefs are innate in or innate with the soul. This is well known as the doctrine which Descartes is supposed to have taught, and to the refutation of which Locke devoted the first book of his *Essay*. It is that the intellect finds itself at birth or as soon as it wakes to conscious activity, to be possessed of ideas to which it has only to attach the appropriate names, or of judgments which it needs only to express in fit propositions. Whether this doctrine as thus defined and stated, was ever held by any one may perhaps be questioned. Even Descartes himself seems, when pressed, wholly to abandon the doctrine which he had earnestly propounded and made the foundation of the most important conclusions. That many have used language which would admit only of this construction can be satisfactorily shown. But no philosopher would be thought worthy of attention who should contend that these primary conceptions are formed by the mind without the experience of individual objects, or that the mind at a very early period of its activity has any judgments which involve them. All will agree that it is only after the experience of many individual objects that these conceptions are developed to its distinct apprehension, and that the mind must reach the highest and last stage of its development before the so-called innate ideas are born into life.

On the other hand, it would be conceded by many, and can be defended as true, that the capacity to evolve these ideas and these truths is born with man and forms an essential feature of his constitution as a man. Not only is he endowed with these capacities but he is also furnished with tendencies which impel to their exercise, under which these conceptions and judgments are surely and necessarily developed so soon as the mind applies the necessary attention or awakes to the requisite conditions. Even before these conceptions are generalised they are assented to in the individual and concrete, in the most important kinds of knowledge.

What is innate in man is, then, the capacity to know objects under these universal and necessary relations so soon as the mind is sufficiently developed, or finds the requisite occasion to apply them. There is innate, also, the necessity, so soon as the mind reflects on the relation of these truths to the rest of its knowledge, that it should find in them the foundations of or necessary assumptions for all that it knows. Moreover, as soon as it considers itself as being born with a constitution which fits it to know, it must recognise the capacity for receiving these fundamental truths and for receiving them as *fundamental*, to be born with its being.

The views of Locke and his school.

§ 531. 4. From the doctrine of innate ideas and the school of Descartes, the transition is natural and direct to the views held by Locke and the several divisions of his school. These are naturally grouped together, though the interpretations of the meaning of Locke are very diverse, and the several schools that are named after Locke hold opposite and incompatible opinions. It will be found, however, that they all can be traced to Locke, either as they are sanctioned by his direct authority or were derived from some of his principles by logical deduction or natural growth; or as they were devised to supplement some of his supposed oversights or defects. These various schools also, in their turn, prepared the way for the origination and development of the leading schools of the later modern philosophy.

Locke's views of innate ideas.

Locke, as is well known, rejected the doctrine of innate ideas and protested most vigorously against it, in the first book of his *Essay*. This protest was of the greatest service to philosophy in delivering it from the vague and fantastical assertions upon this subject which had been allowed before his time. It has been questioned and may be doubted, whether any sober and considerate thinker ever received the doctrine in the form and sense in which Locke rejected it. It is certain that many philosophical writers have expressed themselves in language which warranted the interpretations which Locke thought it necessary to refute.

His statements were unguarded.

But Locke did not guard himself against serious oversights in this polemic. He did not distinguish between our positive ideas of objects and acts in both matter and spirit—which make up the materials or facts of knowledge—and the *relations* between these materials, which, if possible, are more important than the facts which they connect. Nor did he conceive at all the difference between an idea as *acquired* by experience and as *occasioned* by experience. He did not discern that a relation which is developed in experience to conscious apprehension, must be implied or assumed to make experience possible. He did not distinguish between innate ideas and innate dispositions or capacities to develop and assent to the truths which involve original ideas. To correct these oversights, *Leibnitz* subjoined his well-known reply to the adage, "nihil in intellectu quod non prius in sensu"—"nisi ipse intellectus."

His two sources of knowledge.

Locke asserts positively that all our ideas are obtained through two sources, *Sensation* and *Reflection*. Sensation gives the knowledge of sensible objects and their qualities. Reflection gives the knowledge of spirit and its operations. He was careful to add that except through these two sources we have no ideas whatever. What Locke intended by *ideas* admits here of a question similar to that which was noticed in connection with *innate ideas*. Did he mean positively to exclude from ideas those necessary relations by which the mind connects all the objects of matter and spirit which it observes or experiences? It is probable that in saying down these leading positions, this distinction was not in his mind, and that for this reason he did not provide against uncertainty or ambiguity of interpretation. It was not unnatural that different com-

structions should be put upon doctrines thus announced, and that according to these diverse interpretations, there should spring up among his followers different schools of philosophy.

Condillac and other disciples.

One class of those who called themselves his disciples, by greatly limiting or almost setting aside his definition of reflection, interpreted him as teaching that all our positive ideas are of material objects, and perverted his principle so as to make him teach a materialistic philosophy. *Condillac* thus applied his doctrine, and he derived from it the conclusion that all our ideas, whether those of sense or spirit, are simply trans-

formed sensations. "Looke distingue deux sources de nos idées : les sens et la réflexion. Il serait plus exact de n'en reconnaître qu'une source, parce que la réflexion n'est dans son principe que la sensation elle-même, soit parce qu'elle est moins la source des idées que le canal par le quel elles découlent des sens."—*Traité des Sensations.* This doctrine, in the form in which it was taught by Condillac and by others of the French school, was long since abandoned, but tendencies to the same doctrine, if not the same opinions in respect to the nature and origin of mental activities and their products, retain their hold most tenaciously among many modern psychologists, such as J. S. Mill, and Alexander Bain, with others.

Hume's relation to Locke.

Hume (*Treatise on Human Nature*. Part III. §§ 2, 3, 4, 14, 15. *Inquiry concerning the Human Understanding.* § 7.) applied the dictum of Locke in respect to the sources of knowledge in the analysis of the relation of causation, or as he called it, of the idea of *Cause and Effect*, and of *Necessary Connexion*. He first demonstrated, as it was easy to do, that this idea could not be gained from Sensation. He then inquires whether it can be gained by Reflection, or the conscious experience which we have of the exercise of power in the production of effects by volition. To this he answers in the negative, experience giving us only the invariable succession or the constant conjunction of these internal ideas.

How then, he asks, does it happen that we connect objects as causes and effects, and what is the meaning of the combination? We certainly do thus connect them, and we give to them as thus connected the names respectively of causes and effects. To his own question, he replies: Objects which are observed to be always conjoined, we invariably associate in our minds. When we observe the one we cannot avoid thinking of the other. The principle of association is that which explains, and it is the only mental law that explains the combination of objects and events as causes and effects.

The Associational School.

The solution applied by Hume to the single relation of cause and effect, has since his time been applied to the explanation of other of the so-called necessary truths or primitive cognitions. *Dugald Stewart* used it to account for the belief that every visible or colored, i. e., every object involves a belief in, and an apprehension of, extension. *Dr. Thomas Brown* carried it still farther, applying it to a great number of relations.

James Mill, in his *Analysis of the Human Mind*, was the first to find in the doctrine of inseparable or indissoluble associations a solvent for all necessary beliefs and original conceptions. *John Stuart Mill*, his son, in his *Logic and Examination of the Philosophy of Sir William Hamilton*, has applied this principle in detail to all the so-called original and necessary truths with the conceptions which they involve. He has attempted by this single formula to show that mathematical conceptions and axioms are generalized from experience, that the universal and necessary belief in causation is to be accounted for by experience only, and results from associations that cannot be overcome or separated. *Herbert Spencer*, while on the one hand he earnestly contends that the inconceivability of the opposite is the decisive test of original truths, holds that these very axioms are our earliest inductions from experience. Moreover, he holds that the capacity of induction itself is the result of processes of association which descend from one generation to another, with an augmented tendency, till they acquire that irresistible force which excludes the conceivability of their opposite. All these writers may be said to belong to the school of Locke, but they receive only one or two of his leading doctrines and interpret them in a narrow spirit, and apply them to explain conceptions and beliefs to which Locke never thought of applying them.

Dr. Reid and the Scottish School.

Dr. Thomas Reid, with Hutcheson, Oswald, and Beattie, was aroused by the skeptical conclusions derived by Hume and Berkeley from the doctrines of Locke, to combat his principle as it had till then been interpreted—that all ideas are obtained from sensation or reflection—and to assert for the mind itself an independent power or source of knowledge. This power was called by them *Common Sense*, and to it was referred our

belief in the original and fundamental elements of all knowledge. Reid was especially earnest in asserting the necessity of *first principles* as the foundations of knowledge in general and of every special science in particular. Of these principles there is a great variety—*logical, grammatical, mathematical, moral, æthetical, and metaphysical*, as well as those facts given in the experiences of sense and consciousness. All these are discerned by that power which he called *common sense*, or sometimes *judgment*. The nature and the conditions of this faculty he did not exactly define, nor its relations to other powers, the laws of its acting, nor the character and place of its products. He was content to assert that there must be a source of this kind of knowledge independent of experience, and that these first truths are to be received upon its authority. *Dugald Stewart* followed Reid in insisting upon "*fundamental laws of Human Belief*," and "*original elements of Human Knowledge*." He subjected to further analysis some of those truths which were asserted by Reid to be original, and allowed to the law of association an influence which Reid had not recognized. *Brown* deviated materially from Reid and Stewart in attaching greater im-

portance, in his analysis of our conceptions, to the law of association. He resolved the relation of cause and effect into that of invariable antecedence and succession. He occasionally refers to some original belief or tendency to belief as necessary to explain our actual experience. He also distinctly recognizes a faculty or power called *relative suggestion*, which of itself originates or discerns certain original relations; making it, like Reid's *judgment*, to be itself the originator and voucher for these original relations or categories. His system is not always congruous or consistent with itself, inasmuch as he attributes greater authority at one time to the associational, and at another to the intuitional element.

The French School.

In France, *Royer Collard* and *Jouffroy* followed in general the method and the doctrines of Reid, with a more analytic scrutiny and a more systematic arrangement of the original data of knowledge. Each of these writers made some important improvements upon the doctrines of their teachers.

Maine de Biran followed out the doctrine of Locke in respect to Reflection, and attempted to find in Reflection the source of some important first truths. He went further than Locke in this direction and borrowed from Leibnitz some important modifications of Locke's teachings in respect to the nature of force, and the essential activity of the mind as a discoverer of original and independent truth. *Cousin* sought to unite Reid, Collard, and Kant.

These writers might perhaps be more properly grouped together as belonging to a separate school—the *Scottish*, or the *Scottish and French School*. But a more careful study of the doctrines of Locke reveals the fact that in the latter part of the *Essay*, when he came to analyze and account for the ideas of relation, particularly of such primitive relations as *substance*, *cause*, and *adaptation*, he departs from the doctrines which he was supposed to have laid down in the preceding chapters. He certainly did not place that construction upon them which many of his disciples imposed after his time. In accounting for these original ideas, he seems to ascribe them directly to the intellect itself, and to an original power to discern, and an original necessity to receive them as true. In short, without asserting, in form, any new source of ideas, and without in the least abandoning his previous teachings—while in reply to the objections which were brought against him for inconsistency, he earnestly defends his own consistency with himself—he does in fact take the same ground with Reid and the Scottish School.

If this is a correct interpretation of Locke's real opinions, then Reid and his disciples are properly connected with the school of Locke, notwithstanding their earnest polemic against some of the doctrines which they supposed him to teach.

Kant and his School.

§ 532. 5. From Hume and Reid, who were antagonist disciples in the school of Locke, we pass to the speculations of *Kant* and consider his views of *first principles* and the *categories*. Kant, like Reid, was aroused by the skepticism of Hume to investigate the foundations of knowledge. He saw that if the solution given by Hume of the relation

of causation were accepted and applied to others which are as original and fundamental, then scientific knowledge would be impossible, and religious faith would be unsupported by any rational foundations. He therefore set himself to the work of examining, by critical analysis, the intellectual powers, to ascertain, if possible, whether knowledge *a priori* is necessary, and if so, what must be its original elements and authority. The result of his critical inquiries was as follows: The human intellect may be considered as *Sense*, *Understanding*, and *Reason*, and to each of these powers or modes of action, there are elements *a priori*. To the *Sense*, space and time must be assumed as *a priori* conditions. If these are not thus assumed, neither perception nor consciousness could possibly gain the knowledge appropriate to each. Moreover, unless the knowledge of both space and time is *a priori*, the mathematical sciences would be impossible.

The *Understanding* is the power of generalizing and logical reasoning. To this, certain forms of conception are also necessary as its *a priori* conditions, such as *substance and attribute*, and *cause and effect*. Without these forms *a priori*, the processes of the *Understanding* would be impossible and their products would be untrustworthy.

The *Reason* is the power by which we give unity to our knowledge of both material and spiritual phenomena, as well in the several portions of each, as in these portions as mutually connected and related in a universe. To this unifying process, there must be assumed, as necessary presuppositions, certain ideas *a priori*, viz.: *the soul, the world, and God*.

The *a priori* elements of our knowledge, according to Kant, are the receptivities of space and time for the *Senses*; the forms or categories for the *Understanding*; and the ideas for the *Reason*. That these elements are assumed and applied in all our higher knowledge, was shown by Kant to follow necessarily from the analysis of that knowledge which is gained by the intellect, and indirectly from the analysis of the operations of the intellect themselves. These were the positive results of his psychological analysis.

But Kant raised another inquiry. Are these *a priori* and necessary assumptions themselves worthy of confidence? Are they true and do they hold good of the nature of things, or do they simply arise from the constitution of the human intellect—a change in which might involve a change in these necessary relations and in the knowledge which is built upon them? To these questions of his own asking, Kant makes the following reply: These assumptions have for man a *regulative force*, but perhaps only a *relative truth and validity*. That is, while man must act in his intellectual processes under the belief that these principles are primary and universal, and thus admit them as giving law to his own intellect, and as ground-

and explaining all his knowledge, he is not authorised merely to assume that they hold good as the laws of minds which may be supposed to be constituted differently from those of human beings, or that they hold true of the knowledge which such beings acquire. On the one hand, we cannot deny that they do hold true for other beings and their knowledge; and on the other, we cannot deny that they do not. For aught that we know, it may be true, that other beings may be so constituted as not to assume these principles or to know by means of the relations which they involve. We cannot affirm that there are such beings. We cannot deny that there may be. We cannot conceive how there should be. We cannot imagine intellectual processes that do not run back into these relations and principles, nor can we conceive of any knowledge which is not held together by these relations, but we have no rational ground for denying that both are possible.

This is the last result of the critical examination to which Kant subjected the speculative Reason. These views have had extensive currency among the philosophers of Germany and England, and the assertion of them has wrought like leaven, to stimulate inquiry and to excite to counter assertions. Many who would not accept them have found it difficult to show their groundlessness or their untruth, in part or in whole. Many philosophers who have followed Kant in his analysis of the foundations of our knowledge, have felt themselves constrained to enter a special protest against these views, or to seek to vindicate the counter theory.

Criticism of
Kant's skeptical
conclusions.

§ 533. The only part of Kant's theory with which we are here concerned is the suggestion which he makes, that the relations and principles which we find to be original and assume to be true for our own thinking and knowledge, are not necessarily true and valid for the thinking and knowledge of others.

Concerning this we observe:

The conclusion
is purely specu-
lative.

(1.) It is a question of Speculative Philosophy or Metaphysics, and not at all a question of Psychology. Psychologically considered, the views of Kant do not differ materially from those of other philosophers in this, that certain truths must be received as universal and necessary, and that these are given to the mind *a priori*. It is one chief object of his *critique* to show that such principles are not obtained by experience, but must be assumed in order to make experience possible, as without them we could have neither experience nor science. So far as the analysis of the powers, the processes, or the products of the human mind is concerned, Kant is, in his general views, at one with all the best philosophers.

That which he subjoins to this ascertained result of psychological analysis, is the suggestion that this may be true in human psychology only, and not in the psychology of other knowing beings. Whatever may be the probability or reasonableness of this suggestion, it is in no sense a psychological fact. It is purely a philosophical thesis, to be urged and defended on speculative grounds, but which cannot in any sense be said to be given by the analysis of the workings of the souls of other possible races or kinds of beings, or of the products which they have evolved.

Unsupported by
analogy.

(2.) This metaphysical suggestion or thesis is unsupported by any grounds of analogy or probability. The facts which suggested the analysis are the known changes in the objects of sense-perception, which are connected with known changes in the organism of the perceiver or in the medium by which the perceiver apprehends. These changes are most conspicuous in vision. An object seen through a colored lens, be it red or green or blue, is seen to be red or green or blue. In like manner, the color of objects is, to a limited extent, affected by changes in the physical condition of the eye. Some men, through disease, see objects variously colored. Others are incapable of seeing any differences of color, or at best, only a few varieties.

Upon analogies derived from these facts, Kant justifies himself in asserting that there may or might exist created or finite minds which know objects without the relations of *time, space, substance, causality, or design*. To this it is enough to reply that the facts from which these suggestions are derived are phenomena of the corporeal organism—while the acts and objects to which they are applied by way of analogy pertain to the pure intellect. We know moreover of the phenomena of the organism, that the corporeal organism is a factor which, with material conditions, not only *presents* the object for the mind to perceive, but makes it to be what it is to a certain extent, so that the object changes with its changing factors and conditions. But to these thought or intellectual relations no such conditions are required. Certainly the objects are not known to change with any conditions. So far as these relations are applied to material beings it makes no difference what the objects are. Many are equally applicable to spiritual beings, and their phenomena, products, and trustworthiness cannot be weakened or set aside by analogies derived from material beings and phenomena.

All positive ground for finding or applying any analogies of the kind utterly fails.

It is self-de-
structive and
suicidal.

(3.) The suggestion of Kant is inconsistent with, and overthrown by, the reach and necessary use of some of these very relations which are brought into distrust. It is open to the charge of being an intellectual *felix de se*. For example, all the positive ground for the suggestion, founded upon an analogy which we have shown to be *irrelevant*, because *irrelevant*, rests upon one of these first truths themselves, one of these very original relations, which Kant subjects to metaphysical doubt, as to whether it may not be merely contingent upon the human constitution. We cannot but observe that the question which he raises, is whether

knowledge by these relations as a subjective process, and the relations themselves as an objective fact, may not be and probably is, an effect of which the human constitution is a cause. We notice also that the reason by which he supports his suggestion is, that we are justified in so interpreting—which we have shown is misinterpreting—certain signs or indications furnished by analogous phenomena. In this argument it will be obvious to all our readers who accept the analysis which we have given of induction, that the assumptions which he contends are only *regulative* are used and applied by him as though they were *real*. He certainly applies with entire confidence, the relations of cause and effect as necessarily and really pertinent to the constitution of man as viewed by all beings, and wholly omits to notice that he has already suggested that these relations as necessarily employed in human thinking, are merely contingent upon the operation of that thinking, and may not belong to the constitution of the soul as viewed as known by any other being, whether creature or Creator.

This is not all. Not only are they used as though they were real, but they are used as *real* in order to prove that they are only *regulative*. He reasons thus: Upon the validity of the principles to which I must conform as the laws of my human thinking, do I conclude that it is more than probable that they are true of human thinking only. That is, in the very argument that they need apply only to the processes and objects of human thinking, he applies them to both processes and objects of thinking which are not human. How convincing and consistent such reasoning is it is easy to see.

§ 534. 6. From Kant to Hamilton the transition is natural, because the connection between their views is most intimate. Hamilton holds that our native cognitions are both *Universal* and *Necessary*. The Necessity of a cognition may, however, be of two species. It may be either *Positive* or *Negative*. It may either result from the power of the thinking principle, or from the *powerlessness* of the same to think otherwise.

Of *Positive Cognitions* he says: "To this class belong the notion of existence and its modifications, the principles of identity, contradiction, and excluded middle, the intuitions of space and time." All these are discerned by the mind by a necessity which positively pertains to the objects discerned and in the reality of which the mind absolutely confides.

To the other class belong the relations of *Substance* and *Phenomena*, and of *Cause* and *Effect*. These are necessary through the imbecility of the mind to conceive of existence in any other way than under these relations; which necessity, however, is felt to result from the mind's imbecility to think otherwise, and not to represent a positive relation. This necessity is only a special case of the application of the more general law of the *conditioned*, which in its turn is described as the necessity which constrains the mind to think of every object as a medium between two extremes, each of which are mutually contradictory of one another and so both cannot be true, while yet the mind must think the object under one of the two.

The exposition and discussion of this Law of the Conditioned may be deferred till we consider its application to the special conceptions and relations of Substance and Phenomena, and of Cause and Effect.

It is enough to say here, that if it mean any thing, it seems to be in its principle the same with the doctrine of Kant, that certain cognitions are necessary to the mind because of its peculiar constitution, which would no longer be so in case this constitution were changed or other than it is. They are therefore *Regulative* only, that is, they control the actions of the human mind and their products, because we cannot avoid employing them, knowing all the while that we are obliged to do this because we are finite. They are true relatively, i. e., true only in relation to our limited capacities.

We urge against it substantially the same objections to which the doctrine of Kant is liable, viz.: that we must use these very conceptions which are said to be merely *Regulative* and *Relative*, in the very judgments which we form of the mind itself and its processes; and again, its tendency is *skeptical*, like that of Kant. It ought to be regarded with distrust if for no other reason than that it introduces contradiction between the decisions and dicta of the separate activities of the intellect.

§ 535. 7. To meet, or rather, to shut off, the difficulties propounded by Kant, and in part assented to by Hamilton, *Faith* has been proposed as the source of certain original conceptions and primary beliefs. Sometimes *feeling*, or some not more akin to the emotive than to the intellectual powers, has been urged as the originator and voucher of the primary beliefs, and indirectly of the knowledge which is built upon them. This

faith or feeling has most usually had for its object or objects, the *Absolute* or the *Infinite*, and the *Unconditioned*, rather than the special conceptions under which finite objects are thought by the mind and the primary relations by means of which these objects are classified and connected. *God*, *the Soul*, *Time*, *Space*, *Immortality*—have been usually the objects which it is asserted are received by this original assent of Faith or Feeling. Sometimes the moral relations have been conceived as the direct object of the soul's apprehension, together with God and the soul. The tendency to cut the knot which an intellectual analysis has failed to untie, is most conspicuous as perpetually reappearing in the whole history of modern philosophy. The need of an ultimate and decisive authority for our confidence in the notions of the soul, has often prompted to a *coup de main*, by which some usurping power, under the fairest names, has seated itself in the place of rule, and the usurpation has been acquiesced in for the time by the temporary peace and order which has followed in the intellectual convictions and the received systems of science, morality, and theology.

Hamilton's Positive and Negative Necessity.

Sanctioned by
Descartes

Descartes, having vainly sought for some criterion of truth which should assure him that his senses did not deceive him, and that his judgments in regard to his spiritual operations might be trusted, found repose in the veracity and benevolence of the Great Creator, of whose existence he was assured by the innate idea which attests both his existence and his perfection. This being given, the cognitions and inferences of the intellectual faculty are to be trusted when they are properly tested by the criteria or norms which the Creator himself has provided.

By Kant in his
Practical Reason.

Kant, after despairing to find in the speculative Reason any warrant for trusting those necessary cognitions which are universal to all men and assumed *a priori* as the conditions of all experience and all science, finds in the categorical imperative of the Practical Reason a voucher for the law of Duty. Unconditional faith in Duty is the corner-stone of his system, the only sure foundation which he can find among the ruins into which he had disintegrated the structures of the merely speculative Intellect, and upon which he can rebuild the same structure and make it compact and safe. Faith in Duty requires faith in God to defend and reward Duty. Hence the same Practical Reason which commands us categorically (i. e., unconditionally and without asking or finding reasons or grounds) to believe in Duty, commands us to believe there is a true and perfect God. But such a God will not deceive his creatures. He is the voucher that we may trust the speculative testimony of the Reason which he has constructed and created, concerning those conceptions and relations which it originates and requires; and that we may assign them the place which they take and hold in our knowledge, not as being merely *a priori* assumptions under which we are obliged to think, but as being fundamental truths which we must accept as real. By the Practical Reason we make these forms of thought by which we must regulate our thinking, to become the representatives of those forms of being which control the world of reality.

By Jacobi under
various titles.

Jacobi felt the difficulties in which Kant involved himself and the minds of his generation, but was not content with the solution which he furnished. He adopted another, similar in principle, indeed, but slightly varied in its applications. To the power of apprehending that which is primarily and unconditionally true, he gave the names, at first of *Faith*, afterwards of *Feeling* and the *Revelation of the Divine*, and last of all, of *Reason Proper*. The objects which this power apprehends are neither primarily nor exclusively moral relations, but the objects of sense and consciousness with the relations which they involve, as truly as God, the Soul, and Immortality. These are all received by the direct faith of the soul, and this faith and the truth of what it receives is the precondition of all analysis, inference and deduction. In all these processes we simply distinctly analyze and clearly explicate what is given to faith impliedly and as a whole. Jacobi simply asserted these principles as the foundation truths of all knowledge. He did not show how they could be true or why we believe them. Indeed, he despaired of any such analysis. He did not feel adequate to illustrate them in the detail; but he rested in their truth.

Schleiermacher's
feeling of
dependance.

Schleiermacher recognised feeling—the feeling of dependance—as the ground and medium of all the knowledge of the absolute that we can attain. But we cannot conceive of God or define our concepts of him. All efforts in this direction, as well as their results, are entirely inadequate and misleading. So far he is at one with Jacobi. With him he makes feeling or faith the ground of our apprehension of the Infinite and Divine. In respect to our knowledge of and faith in the conceptions that are fundamental to finite knowledge—he would be foremost to assert that these are *a priori* conditions and assumptions of the intellect, and that nature herself is constructed in correspondence with these forms of human thought. We have therefore the amplest ground for trusting the processes that are essential to our higher knowledge and the results to which they conduct us. The relations of finite existence, including those of space and of time, of substance and attribute, of cause and effect, were considered by Schleiermacher forms of existence, or real forms in contradistinction to the subjective forms of Kant and Fichte and the notion forms of Hegel. These are apprehended by the intellect directly, or, in the phraseology of his system, by the *intellectual function*, to which, operating in connection with the *organic function*, all the forms of finite knowledge are to be referred.

Chalybaeus,
Reiff, and Lotze.

Some of the more recent German philosophers, as Chalybaeus, Reiff, and preëminently Lotze, rest their confidence in the fundamental assumptions of the human intellect, upon ethical grounds. The questions propounded by Kant, viz.: 'Suppose after all that the constitution of your nature should itself not be trustworthy when it causes and impels you to think according to these original forms and fundamental assumptions? Suppose that there should be no reality in the relations or forms of things, which seem to correspond to the relations or forms by which you think?' they answer thus: 'We must believe that nature is benevolent in her indications and therefore true. We assume that goodness and veracity regulate both the objective relations of the universe which we study and the subjective constitution of the intellect which interprets it. For these reasons we rely upon the categories of both thought and being, and learn and think in accordance with them, trusting the results which we gain.'

This theory sanctioned by Hamilton also. As Hamilton (as we have seen), in his views of the extent and limits of our knowledge, followed both Kant and Schleiermacher, so he borrowed from both the required solution. While he asserts that we cannot think the *infinite* and *unconditioned*, because *to think is to limit* and *to condition*, he concedes that we *know* the same. But when asked how! he replies, by *faith*. We must believe it to be. The extremes of our knowledge, between which we form our concepts—and out of the relations of which we form our concepts—we must believe exist and are related to one another. The fact of their necessary existence we receive by a direct insight, which he calls both faith and knowledge. He borrows from Kant conceptions that are appropriate to the Practical Reason—so far at least as ethical distinctions, moral liberty and a personal God are concerned. From Jacobi he adopts the term faith in application to the whole subject. With the doctrine of Schleiermacher the details of his theory of the Unconditioned are closely allied. Cf. Hamilton, *Met. Lec.* 36. Also, *Appendix v. Letter to Colderwood*.

Reasons why it is plausible. That which gives plausibility to the doctrine that Faith or Feeling is the ultimate ground of this kind of knowledge is that it is not received by any act of conscious assent to propositions, of which the elementary concepts are first distinctly apprehended apart and then united, but the mind is impelled to form separate concepts by means of and under certain general relations. The belief or conviction that prompts to this is developed to the mind when it reflects upon what it finds itself performing. Hence the act is called faith in opposition to and in distinction from judgment, the last being supposed to involve analysis as well as combination. Ethical and religious objects are those which most frequently bring it into exercise, and these invariably excite more or less feeling. Hence the special source of these convictions is conceived as something not intellectual, and the terms faith and feeling are applied to it. The oversight lies in making these terms to imply that the act is not intellectual. It is preeminently an intellectual act and power, for it conditions all the special acts and cognitions of which the intellect is capable.

§ 536. 8. The immediate successor of Kant was J. G. Fichte, whose system was proposed as a modification and improvement of that which was taught in the *Critique of the Pure Reason*. Fichte derived all knowledge, the materials as well as the forms, the *d posteriori* and the *d priori*, from the activity of the Ego. Every thing which the mind knows, being as well as relations, so far as it is known, is the work of the Ego, and evolved from its own creative activity.

So far as the categories of thought are concerned, Fichte endeavors to show that each one of them is necessarily involved in the several concrete creative acts by which the Ego constructs for itself the known universe. Its first act is to affirm its own being. But in that it must apply and evolve the law or relation of identity, $A=A$. Its second act is to affirm the non-ego. But this in like manner involves the law of contradiction, (A) is not ($\text{non-}A$). The third is to recognise the indivisible Ego as opposed to a divisible non-Ego. This involves the reciprocal activity of each on the other, and this implies the relation of Causative efficiency. The other relations are all evolved in a similar way by the productive activity of the Ego, together with the non-Ego which this activity calls forth. *Time* and *space*, *substance* and *attribute*, *reality*, *possibility* and *necessity*, etc., etc., are all accounted for by the creative activity of the Ego, as it proceeds from the simpler to the more complex processes and products of human knowledge.

Schelling's view of the categories. § 537. 9. Schelling follows Fichte—by the effort to mediate between him and Kant—so far as to provide for a common origination and relationship for the subjective and objective. His *intellectual intuition* recognises at first the indifference of both, from which it develops in correspondence to one another the forms of thought and the forms of being. The authority for the categories in this double application must be in this intuition which affirms them to be common to the two. In his later philosophy, which was modified to avoid and displace the logical Idealism of Hegel, Schelling assumes the reality of concrete and actual being, and teaches the mind's competence to originate and affirm necessary and original relations only in their application to and by occasion of supposed concrete knowledge. For this reason he asserted for these *d priori* relations and for philosophy itself, what he called only a *negative* value.

Hegel's theory of pure thought. § 538. 10. Hegel substituted *thought* for Schelling's *intellectual intuition*, i. e., that mental activity which produces and is concerned with the concept or logical notion; but made a fatal mistake by conceiving that *thought*, viz., *abstract thinking* could be explained independently of *concrete* knowledge and actual being, and that the former could explain the latter by the relations of pure or abstract thought. He was therefore compelled, by logical consistency, to endeavor to evolve and explain every form of actual being by the development or evolution of the notion from within itself.

The categories or the original and necessary relations of knowledge, according to Hegel, are all the relations which are necessarily evolved in the process by which simple, i. e., abstract being is developed into all the forms of thought and existence, and through them all, till the absolute is attained, i. e., till the process is complete and with it the cycle of the original relations or categories which are required for its evolution.

Herbert's
Theory.

§ 539. 11. According to *Herbert*, some of the categories are the products of the action and reaction of ideas. They are not the necessary laws or forms of the mind's knowledge, but are the growth and result of its psychological functions as determined by the laws which govern the formation and mutual action of the results of the impressions made upon the soul by matter, and the soul's reaction against them.

These results are perceptions or representations. Concepts, or general notions, arise only when a number of similar objects have been perceived. In their struggle for reappearance the differing elements crowd one another out of view, and only those are apparent which, being alike, reinforce one another, and so survive the struggle. The conceptions of Space and Time are series of reproduced objects, the parts of which are more or less indistinct, as they stand related to *the here* and *the now*. A thing or being and its attributes, is either an original whole analysed into its constituent parts, giving the attribute of quality, or a whole with its attendant series of time and space accompaniments giving the attribute of quantity. The successful connection of these attendant parts or accessory series is affirmation—the unsuccessful is negation—both these involve the two forms of judgment or the apprehension of relations.

The relations of *substance* to *attributes* and of *cause* and *effect* are inconsistent with the logical laws of *identity* and *contradiction*, which are assumed by *Herbert* to be original and independent laws of thought. To remove these inconsistencies is the object of his metaphysical system. This he essays to do by "*the method of relations*." It would seem that the logical laws are the only categories, properly considered, which *Herbert* accepts, for the reason that these logical criteria are applied by him as the fixed rules and original measures by which every other relation is tried and tested.

§ 540. 12. *Trendelenburg* has not only subjected the doctrines of *Hegel* and *Herbert* to an acute and comprehensive criticism, and in so doing has vindicated that realism which is equally essential to the common sense of every-day life and the scientific confidence of the inductive schools, but he has given special prominence to the importance of *final cause* in its relations to the sciences of nature, as well as to metaphysical and ethical truth. He has been equally successful in criticising the speculations of such as derive the categories from the necessary and independent relations of pure thinking, and the dogmas of those who find their origin in the empirical processes of psychological experience or the formalistic dicta of an irresponsible logic. But most of all has he been distinguished for the ingenious and able derivation of the categories of *thought* and *being*, of *spirit* and *matter*, of *space* and *time*, from that universal and all-pervading motion which is common to all. Those who hesitate to accept his dogma in every application which he makes of it, will not question that he has at least made good the thesis that physical motion and its mental analogon furnish the ultimate elements that are employed in the constructions of the creative imagination and of synthetic thought; that motion contributes the material by which mathematical creations and metaphysical definitions can be represented in language and enshrined in those definitions and propositions by which they are the permanent possessions of the race.

CHAPTER III.

FORMAL RELATIONS OR CATEGORIES.

FOLLOWING the classification of categories or intuitions which we have adopted and explained (§ 524), we begin with those which we have defined as *formal*. These are so-called because they are involved in every form of knowledge: they are essential to its very form, and are therefore called *formal*. Whatever may be the mode of an act of knowledge subjectively viewed, or whatever may be that with which it is occupied when objectively considered, it must involve these relations in its very nature and essence. They are not the less real than the other relations, but they do not require real objects in order that they should exist. A represented *image*, a mathematical construction, and a thought-concept not only admit but require them, and they are common and essential to them all.

The category of
being.

§ 541. The intuition with which we begin is the intuition of *being*. This will be readily acknowledged to be the most extensive of all in its application, and therefore *fundamental*

to all others. Every thing which we know, we know to exist. To know is impossible and inconceivable, if it does not involve the certainty that that which is known, *exists* or *is*. Being is the correlate of knowledge.

Hence, this concept is apparently fundamental to all others.

In what sense
fundamental.

It belongs to every object with which the mind has to do in

knowledge, and it belongs to each with equal propriety—to

Him whom we call, in the poverty of our languages, the Being of beings, and to the most transient and trivial creation of the humblest of his creatures; to the universe in the most comprehensive meaning of the term, and to the mathematical point which is the product of the thought of a moment. It is applied to actual existences, to intellectual creations, whether individual or universal; to all things and to all thoughts.

The beings that are known are of different sorts, and they are known by

Beings of differ-
ent sorts.

different modes of apprehension. There are beings spiritual, and beings

material. In each of these classes there are beings which remain for ages,

and those which exist only for an instant. But the difference in the kind

and the endurance of that which is, does not make the object any the less to exist. *Being* as properly belongs to the one as to the other.

We sometimes dignify the being which is independent and permanent with the assertion that this only or truly has being, or only and truly is; but this is by a metaphor only, and does not in the least affect the proper import of the term or of the concept for which it stands. The *positive existence* of the object, but neither its dignity nor its duration, is expressed by the word.

The nature and import of being is not at all affected by the manner in which

Being apprehended in differ-
ent ways.

it is apprehended or known to exist. Some being is known by direct sense-

perception or immediate consciousness; in other words, by presentative

knowledge. Other being is known by indirect or representative knowledge,

as the moon that is pictured by the mind, or that is generalized as a concept. In represented

being, it is presented being which is recalled or generalized. The being which is directly

known as actually knowable or as possibly existing is always supposed or implied as giving

interest and import to that which is recalled. The moon which we picture, is pictured as an

actually existing moon. The scene which we remember or imagine, is remembered or im-

agined as an actually occurring scene. Even the mathematical entity which we construct,

or the general concept which we frame, must be carried back to some concrete being or

beings to be interpreted and understood.

§ 542. It is the most *abstract* of all possible concepts.

The most ab-
stract of all the
categories.

After every property or relation which we know of an

object is set aside from any existing thought or thing, there

remains the affirmation *it is*. This cannot be thought away. For this

reason it is logically the first or the most elementary of all concepts. As

it is the last which we reach by *analysis*, it is the first with which our

synthesis begins.

Concrete or presented being, gives all its meaning to abstract or represented

Explained by
concrete being.

being. The mind interprets generalized being by its previously experienced

or its tacitly assumed knowledge of presented being. Hegel begins the

development and explanation of our real knowledge with the concept of being

in the abstract, and seeks to construct and develop from this the conceptions and knowledge

of real existence, and the relations which it involves. In doing this, he is obliged to interpret his meaning by a tacit assumption of that which he formally ignores and denies—i. e., to draw upon direct and presented knowledge for the interpretation of the conceptions and relations which he professes to develop and account for. The attempt is vain; the method is false; the problem is impossible. There is no knowledge of being, or of the relations of being in general or in the abstract, except by means of knowledge in the concrete.

Psychologically concrete being is first apprehended.

Psychologically, the knowledge of being in the concrete precedes that of being in the abstract. We know individual beings before we know being as a concept. We perceive individual things by sense; we are conscious of our individual *ego* and its individual states; we remember and imagine these and other individual entities long before we comprehend them or any group of them as under the general concept being. Even if it be conceded that, to the infant perception, the material universe presents itself as one undistinguished and undivided being, it would be known as an individual; the one universe and not as generalized.

Logically, it is fundamental.

Logically, or, more properly, *metaphysically*, the concept being is the first and most fundamental of all the concepts, because it is the most extensively applied, and is the highest of our generalizations (§ 528). But it cannot be understood as a concept, except by our knowledge of individual objects. To begin with the concept in the abstract, excluding that knowledge which interprets and makes it clear, is literally to begin with nothing. To attempt to develop from it actual being, is to give an example by failure, of the truth, *ex nihilo nihil fit!*

The apprehension of being expressed in propositions.

§ 543. The knowledge of being is expressed by judgments or propositions, the subjects of which are whatever is known by any single acts of the intellect. We tacitly assert or think of every such object *it* or *this*, *is* or *exists*. We afterward generalize that which is predicated under the concept—being.

Being not a relation or attribute.

Being or existence is not, however, an attribute or a relation, though it is conceived or treated as such when it is thus generalized. It is obvious that being must be assumed in order that an attribute or relation may be known. Relations without beings related, or the knowledge of relations or attributes without the knowledge of beings to which these relations or attributes belong, are impossible and inconceivable. When being is generalized, however, it is treated as a property or attribute of each concrete existence of which it is affirmed. We say and think this or that has being or existence. We say it is an existing thing. We even turn it into an *abstraction*, as we do other properties and relations, and speak of *beingness* or *entity*. Yet the incongruity of the language and of the conception is apparent when we undertake to carry it out by affirming *entity* or *beingness* of an object.

It cannot be defined.

§ 544. Like every intuition, being cannot be defined—i. e., analyzed or resolved into any more elementary constituents.

It can be *described*, however, by means of the conditions or circumstances under which it is present to the mind. When we ask, What is being? we cannot answer in the way of definition. But we can say, whenever we know we apprehend being. In every act of knowledge is involved assent to, or certainty of being. By knowing we are in a situation to understand, though we cannot define, the import of the concept.

The act of knowing is supposed to be more familiar than the concepts which it implies. We exercise this activity more frequently and more readily than we reflectively analyze its known objects. For this reason we explain the concept being by the act which implies and contains it. When we closely consider what to know involves, we find that the apprehension of being must always be implied in the act of knowledge.

It was said (§ 390) that all concepts are founded on attributes or relations generalized, and that the only difference between nouns and adjectives arises from their use and not their meaning; the same content being present in every case—a content of attributes only. How, then, it might be urged, is it possible that there should be any concept of being at all if being is not only not an attribute, but is the direct contrast of an attribute and must be supposed to make an attribute conceivable or possible? This inquiry has in part been answered. In order to be turned into a concept, being is treated as an attribute; it is predicated of the individuals to which it belongs as though it were a predicable. The attempt is made to define—i. e., to describe it by its relation to the act of knowledge, or the activity of the knowing agent. The word being, in its etymology, is also taken from some one of the attributes of those existences which are the most permanent—which existences or entities are conceived as having the best right or claim to be so used, as to *stand*, etc., etc. •

A wholly indeterminate concept.

§ 545. Simple being is a concept wholly *indeterminate*. It stands for itself and for nothing besides. Being elementary and logically original, it can be resolved into no other, and, of course, can be defined by no other. It is supposed in every other. It must be assumed to determine every other. We must begin with being, before we can add a single characteristic to make it a concept more definite.

Hegel makes being equal to nothing.

This is what Hegel had in mind in his assertion: *Being or entity is equal to nothing*. It is equivalent to a notion without content. As an abstract conception, it has no relations to any other concept, and consequently no attributes; it is wholly undefined. By viewing it as abstracted from all concrete import, it has no content at all; it means nothing; all its meaning must lie in its relation to some other concept, and until it is viewed in such a relation it has no positive import at all. That Hegel was wrong in this assertion, will be shown in its place. We notice here only what he must have had in mind.

Being, the undeterminate, immediate object of knowledge, is *... next nothing*, no more nor less. Nothing is [has] the same determination, or rather, absence of determination with, and, for that reason, is equivalent to simple entity. *Logic*, vol. i. p. 23. *Encyc.*, p. 101.

The common sense of man which resists the doctrine that being and nothing are identical, and appeals to some object of experience immediately present, finds in this very object some determinate being that is being with a negation, i. e., the very unity which it rejects. *Log.* vol. i. p. 30. *Encyc.*, p. 406.

Not without signification.

But though being, as a concept, and in its relation to other concepts, is indeterminate, it is not without signification. It is taken from and affirmed of and interpreted by, individual beings which we actually know by direct knowledge. The formation and use of this concept presupposes and rests upon this knowledge. Though abstract being, as a concept, is elementary, undefined, and equal to non-entity, yet, as related to individual beings, it signifies something positive, and, indeed, many positive somethings. Though being denotes no particular thing, it does not denote a thing actually not existing—non-entity—but is equally applicable to every positive—i. e., to all entities whatsoever.

Relationship.
Diversity.

§ 546. Referring to our analysis of the act of knowing, we find that it involves the discernment of *relations* as truly and as essentially as it does the apprehension of being. This introduces to us *relationship* in its widest acceptance. But relationship involves diversity and distinguishability in the *concept* produced, and negation or distinction as the judgment or proposition by which it is discerned and affirmed.

Two entities—*i. e.*, objects apprehended—are essential to the apprehension of a connecting relation. But if the two are known, they must be distinguished—*i. e.*, known as different from each other, in order that they may be again connected. The knowledge of objects, as different or diverse, must always be present with the apprehension of any other relation.

Diversity the
most extensive.

It follows that the relation which is the most extensive of all others, is the relation of diversity or difference. It is always present with every other. It may not always be distinctly recognized, but it is always recognizable in every positive relation, whether formal, mathematical, or real.

The same truth is asserted in the proposition, that every act of knowledge is at once an act of analysis and of synthesis. In every single act of knowledge we separate—*i. e.*, distinguish—in order that we may combine. We can only unite so far as we separate.

Present in all
forms of knowl-
edge.

This truth is confirmed, if we refer to various kinds or species of knowledge. In each of these we distinguish as we unite. In sense-perception we distinguish *colors, sounds, tastes, feels*, and gather them into one object. In consciousness we distinguish the actor from the act, and both from the object, and unite them somehow in a single mental experience. Certainly we place them together in a single undivided instant of time. In memory and generalising, in deduction and induction, we unite what we have already distinguished, or what we distinguish in the act of uniting.

We repeat what has been already laid down, that entities, in order to be distinguished, need not exist apart, *i. e.*, not in the common sense of the term *to exist*. The angles and sides of a triangle cannot exist nor be constructed apart from each other, and yet they can be most readily distinguished. The moon which I picture in the mind cannot exist except by the act of the mind which imagines it, the attribute cannot exist apart from the substance to which it belongs, the cause cannot act as a cause without passing into the effect; but all these are readily distinguished the one from the other.

Our analysis of Being, *i. e.*, of Being as a concept or Being in general, has compelled us to recognise also Being in the concrete, or individual Being, and the one as related to the other, the one as supposing the other, and the one as explaining the other. In this explanation two relations are supposed, those of diversity and of similarity. If there is more than one concrete Being, one is diverse from the other. If both are alike Beings, *i. e.*, are comprehended under the concept Being, they must be alike at least in that they are both knowable. In brief, diversity and similarity are everywhere present.

Expressed in a
proposition.

§ 547. We return to diversity and negation. The relation of difference or diversity is expressed by the proposition, *this being is not that*. A is not B, or B is not A; the color is not the taste, the taste is not the color; the pictured moon is not the mind, the mind is not the moon which it pictures. I am not the object seen or tasted, etc., etc. It does not signify with which of the objects we begin—which of the two we treat as the subject, and which as the predicate of the proposition.

The act of mind which we express by the proposition, is called an act of denial or negation; *i. e.*, when the relation of difference is expressed in the form of a proposition, the act is an act of negation. The natural form of a positive judgment is also the proposition, which is of course affirmative.

It will be remembered that these propositions are all individual propositions, and that none of them are or can be general. The individual goes before the general in these propositions of relation, as in all others.

From the recognition and affirmation of relations are evolved what are called relative concepts or notions. From the negative propositions which express the relation of diversity are produced what are termed *negative concepts*.

No sooner is A distinguished from B, than we can apply to it the negative notion of *not-B*. In the same way reciprocally, the negative notion *not-A* can be affirmed of B. These notions are purely *relative*. The whole content or import which they express, is limited to the single relation in which they stand to the other object, which other object, A or B, as the case may be, is supposed to be positively known.

In like manner, *other relative notions* may be formed, as if we take a substance and it puts us to sleep, we conceive the unknown something which produces this effect as *sleep-making*; that is, we need know it no further than by its relation to this effect. The only notion which we have of it may be purely relative to the known effect.

The negative relation, as indeed any relative notion, is at first apprehended as individual, and then generalized. No sooner is A pronounced to be *not-B*, than we proceed to apply this to C, D, E, F, etc., as well as to A—indeed, to all objects except B itself. We need know nothing more of them than that they are, to be justified in classing them all as *not-Bs*, or in affirming of them the negative concept thus generalized. This is the ground of the division of all real and conceivable things by *dichotomy*, as it is called.

It will be observed, however, that negation expresses a relation between two actual beings, or two beings treated or conceived as real. It supposes two positives known or conceived, each of which is thought as related negatively to the other.

But after the relation of diversity has been acquired by or developed to the mind, it is possible to attach it to any single notion positively known, without cognizing any object which it designates. For example: To any notion as *chalk*, *marble*, *white*, *merciful*, *financial*, *spiritual*, the negative particle may be attached, indicating some reality or realities diverse from this positive; as the negatively relative notion, *not-chalk*, *not-marble*, *not-white*, *not-merciful*, *not-financial*, *not-spiritual*. The concept, in its import, includes only diversity from the several positives known. But it *implies* that there are or may be other positives which belong under it or to its extent. It is sometimes said that the mind can form a positive notion of a negative object. A closer inspection will show that a positive notion of a negative object or of a pure negation, is impossible. A negative object or negative term indicates only some real or possible object or objects in a *negative relation*.

We can, indeed, form a negative notion of every object positively known, by attaching to it a negative particle; but we do this on the supposition that it represents some positive objects that are knowable because they are real.

The concept
nothing.

The concept *nothing—nonentity*, is a purely relative concept. All beings or entities, whether real or imaginary, are grouped under the most general of all concepts. To this is attached the relation of negation. What is expressed, is the proposition that the concept is exhaustive, and that it is impossible to conceive or believe in any thing beside, i. e., should the mind attempt to form a concept of any object not included under being, it would not succeed: there is not an object to which the concept could be applied: there is not a thing, not a being, not an entity besides. By a fiction of speech and of imagination, this proposition is contracted into the concept *nothing—nonentity*—as though there were a really existing object negatively related to being.

Hegel's view of
nothing.

When Hegel asserts that the concept *being* or *entity* equals *nothing* in its import, he has in mind that it is a concept which cannot be analyzed into any constituent concept or thought-element: it is therefore unrelated to any other; it is undetermined: it has no notional or conceptual import. So far from being true that this concept has no import, no concept has an import so extensive. Its import is found in the various forms of direct knowledge, which give the material and meaning to every concept, and a reference to which is supposed every time the concept *being* is used.

The nothing or nonentity by which Hegel seeks in a sense to define the concept Being or Entity, is simply the concept itself viewed in its relation to every other concept, and also to every object of direct and individual knowledge. It is simply the proposition contracted into a concept, that being or entity, is the most general of all concepts, and cannot be analyzed into, or resolved by any concept more general than itself; or the proposition that abstract or generalised being must not be confounded with concrete or individual being,—being in the second intention is not being in the first intention; or it may be it is both these propositions united into one.

The error of
Hegel.

The error of Hegel lies in attempting to begin the analysis and development of knowledge and of thought even, with thought itself or mediate knowledge, instead of beginning with knowledge that is immediate, as the order of natural production and of psychological acquisition would direct. This error involves the fiction of a possible development of both thought and existence from thought or mediate knowledge only, of an evolution of all being, and all forms of being from the mere formal concept of being in general, which by the very definition is confessed to be empty or void, i. e., mere nonentity. It involves the still more obvious fiction of a perpetual becoming or self-evolution of concept from concept, which is conceived to arise from, or to be equivalent to, or explained as, the vibration between being and nothing, and nothing and being; all the meaning or reality of which must come from that for which it is dexterously substituted, i. e. from the real operations, forces and motions of the actual universe. That there can be no evolution of one notion from another has already been shown, § 523. The original intuitions and relations out of which concepts are generalised, differ from one another really in their greater or less extent of application to objects, not at all in the relations of content or import. The content of one is conceived to be developed from the content of another because, when arranged in the gradations of a logical system, being stands highest or most general of all, and certain other concepts stand lower, and others lower. Hence it is conceived that the notions arranged below those which are higher, are in fact developed from them by an independent movement of self-evolution belonging to the more general concept as such.

In other words, because the concept *being* is the *summun genus* among concepts, it is taken to be the originator of all other concepts. Not only so, it is held, by the same law of self-evolution, to be the originator of things or actual beings. The failure of the attempt, and the absurdity of the theory on which it rests is manifest when the effort is made to cross over from the notion world to the real world; when the effort is essayed to evolve time and space, matter and spirit from concepts only. The effort seems to be successful only because the real world with its relations is ever ready at hand behind the concept world which symbolises it, to furnish the signification which is required. Real being, and real relations are very easily confounded with the generalized concepts of the same. The two are easily interchanged, and it is by a kind of intellectual juggling or sleight-of-hand that any success appears to be attained, or any conviction is produced.

Xenophanes and
Spinoza.

The History of Philosophy records two theories similar to that of Hegel, both, like his, being founded upon the confusion of abstract or notional entity with the concrete or individual being and its relations which it symbolises. They were the theories of the schools of Xenophanes and Spinoza. Both these philosophers reasoned that because the

concept Being was equally applicable to all actual beings, therefore there was but one being actually existing, and that was the sum total of all beings, the *tò ê kai pân*. In the case of the first school, the speculations were vaguely conceived and crudely defined. In the school of Spinoza, the theory was rendered more plausible by his reasoning from the definition of substance furnished by Descartes, § 554, and by his clear conception and his emphatic enforcement of the truth that no finite being can be independent of any other for the beginning or continuance of its existence. Hegel seemed to give the finishing stroke to the argument, when he contended that not only the existence, but even the conception of a finite being involves the knowledge of its relations to all other so-called finite beings; and as actual existence is but the rational result of an ideal or mental conception of the evolution of the whole, so each finite being exists only as it is evolved from and by the whole.

Diversity or negation is applied to a being as distinguished from its relations, to one relation as distinguished from another relation, and also to one being as distinguished from another by means of its relations. While it is true that one being, whether material or spiritual, is distinguished from another by *intuition* or *direct inspection*; it is also true that in the most important parts and uses of our knowledge, we employ relations only, and especially those similar relations by which beings are united under concepts. These last are the essential products and media of all thought-knowledge, the conditions of language, and the aim and achievement of all science.

This introduces us to the category of *substance and attribute*, so far as it is *merely abstract and formal*. We have already seen in our analysis of the formation and application of the concept, that it presupposes similar, and therefore common relations; and that these are singly and in combination affirmable of things which are diverse in the *content* or *essence* by which they are defined, and in the *extent* of beings to which they may be applied.

Whenever a being is thought of, *i. e.*, is distinguished from another being by the number and the extent of its relations, then we have the relation of substance and attribute in its abstract form. What it is in the concrete, and what is the true import of a material and spiritual substance, we will inquire after we have considered the several categories, both mathematical and real, by which these two descriptions of beings are characterized, Chap. VII. We are at present concerned with it only in the abstract, and as a formal relation.

We notice however, that diversity or difference pertains to a concept as truly as to an individual, to a logical essence as properly as to an actual being. Whatever be the object distinguished, however unlike any other in its being or relations; or whether the diversity belongs to the being or its relations, diversity is properly applied to it. The sense or meaning in which one object is diverse from another should, however, always be kept in view.

§ 548. The relation of diversity with its several applications suggests the relation of *identity*. In affirming that A is not

B, or is diverse from B, we are prepared to affirm that A is identical with itself. When we apprehend that A is not B, or that A is not B in some one particular, we can hardly fail to apprehend that it is the same as itself. That the mind comes to the distinct recognition of this relation at an early period of its development, and makes frequent application of it afterwards, is too obvious to need confirmation. That the relation is original, and is intuitively discerned, is almost equally

The relation of
identity.

clear. To attempt to explain it by or to resolve it into any other relation is to fail.

Affirmed of mental existence. Let it be supposed, as many hold, that the first object to which it is applied is the soul itself, as distinguished from the diverse acts and states of which it is conscious. As the ego distinguishes itself from its changing states, it knows that the states are varying, but the ego is the same. In doing so, it must compare itself at one time with itself at another, or itself in one state with itself in another. If this knowledge is expressed in a proposition, the ego in one state and at one time is the subject—the ego at another time and in another state is the predicate coupled with the sameness affirmed. The sameness however is predicated of the same real object. The occasion which excites to its affirmation is described by the diverse form or time under which it is presented to the mind.

This would by some philosophers be held to be a contradiction in terms, an offence against the law of identity itself, because, as it is alleged, the subject and predicate should be terms exactly convertible. That this is a false and narrow view of the nature of predication, and of the law of identity, see P. III. c. v

Or of material. Or it may be that Identity is affirmed of a material object, as of a house, or a ship, a tree, or a horse. In such cases the objects are perceived at different times at least, and are often changed in form, appearance and properties. The test or standard of identity may be real and natural, or it may be conventional and factitious. But the relation itself is not thereby altered. It is properly expressed by a proposition, thus: the object now perceived, or in any form or appearance, is the same as the object perceived formerly, or under a different form and aspect.

Of a purely mental product. Identity may also be applied to a purely mental product. Often it is interchanged with similarity, or the sameness is transferred from the object which is mentally transcribed or pictured, *e. g.*, I have a similar image or concept now of the same object which I previously imagined or thought, as of the same horse, or of horses similar to him in all essential particulars. When the concept is said to be the same, in all times and in all ages, it is not necessary that it should be formed by all men from the same individuals, but it is meant that the similarity between the individual objects is so perfect that one individual may be substituted for another in forming it, and that it may be applied to one as freely and as properly as to another, so that for all the purposes of thought and reasoning and scientific knowledge it is as though the individual objects were the same.

It is in this last sense that *identity* is so conspicuous in logic and philosophy, viz., in the relations of a concept to a concept. It is the identity of a concept with its *content* in propositions of *definition*, or of a concept with its *extent* in propositions of *division*, or of the two as correlated, to which the laws of identity and contradiction in books of logic are applied. The extension of these laws to other kinds of identity and difference has wrought indescribable confusion and error of thinking.

The law of identity, etc. in logic. The *principle* or *law* of *identity* is, in books of logic, connected with the law of contradiction and the law of excluded middle, and the three are set forth as the three fundamental laws or principles of thought. To secure us against the confusion and error of which we have spoken, the inquiry is of great interest and importance, what relation have these laws of thought to the *intuitions* of identity and diversity? In answer to this inquiry we may say:

Concern the relations of concepts to concepts.

These laws of thought concern the relations of concepts to concepts; the intuitions in question concern the relations of beings and things. But as the relations of concepts to concepts are in the last analysis resolved into and founded upon the relations of things, it is manifest that the purely logical principles or laws cannot be received as fundamental. They are the axioms of logical thinking, but not necessarily the rules for every form and mode of knowledge. In logic and thought-knowledge they are such practical rules, or principles from which those rules are derived, as have been found necessary from the dangers to which men are exposed in the use of concepts, from the various forms of expression in which both concepts and their relations are phrased.

The law of identity guards against a twofold danger.

The law of identity is designed to avoid a twofold danger in the use of concepts and terms. We are tempted to suppose, on the one hand, because the diction is altered, that the concepts, propositions, and reasonings are changed, or, on the other, we hastily conclude that two different phrases are equivalent in meaning.

Uses and aims of the law of identity.

To avoid this double exposure we are held by this law to the necessity and the duty of always using and maintaining our concepts in the same import, and of being certain that we mean the same thought when we use the same or equivalent language. Of our concepts, it is only those which are complex which can be tried and tested by this law; and these can be tested both in their content and extent. In its application to the content it asserts that a concept is, for purposes of logic, the same with the sum of its constituting elements: $A = (a, b, c, d, \text{ and } e)$; i. e., all these being taken together, the one is convertible with the other. When applied to the relation of extent, it asserts that the concept as genus is identical with the total of its contained species or subordinate parts. When content and extent are both recognized in any use, then identity in both these particulars is to be respected. To make the logical law of identity a mere meaningless truism, as A is A , or a concept in the same form of diction is identical with itself; is inept and absurd.

Logical founded on real identity.

It is true, as has been said, that in the last analysis logical relations are founded upon real relations, or the relations of concepts upon the relations of things. The principle of identity in logic has its meaning and its use from the assumption that in nature and the constitution of things there are the same powers (i. e., similar), the same causes, the same ends, and the same laws, and that these are represented to the mind in the same concepts with a fixed content and extent. The identity of concepts or logical identity is derived from a special application of that relation of identity which is intuitional and original.

The law of contradiction.

§ 549. A similar remark may be made of the logical axiom or law of contradiction: A is not *not-A*. This is only a generalized application of the intuition of difference to any concept whatever, taken in both extent and content. A thing or a concept is not another, it is not any one of the things or concepts from which it differs, nor all of them united. Expressed as a rule it *requires* "it should never be confounded with them, or substituted for them."

The law of excluded middle is but another application of the intuitions of difference and identity when generalized.

It is, every B is either A or not-A. When A is distinguished from not-A, it is then discerned by reflection that these two divide the extent of all conceivable existences into two classes. This truth is then stated as a principle; which is ready to be used as a law whenever it is required to guard or correct our thinking.

§ 55D. Much evil has resulted from the error of taking these three logical laws as the original and the only laws of our knowledge.

It was entirely natural for philosophers who were practised in the schools of formal logic to suppose that every thing which man believes to be true could be demonstrated by the methods and after the principles of the syllogism. The tenacity with which this persuasion has been adhered to is most remarkable in the history of all systems and schools of thought. For a long period after the revival of philosophy it seemed that man would never cease to attempt to give a logical demonstration for the very axioms and principles on which all demonstration must rest. Logical proof was required for all knowledge, for the belief in a material world, for our confidence in memory, for the distinction between facts of experience and the illusions of the imagination; in short, for every thing known or believed by man. To logical proof the three laws of thought were assumed as the axioms. Hence, upon these three laws was made to rest the whole structure of human knowledge, and from them, the validity of this knowledge was deduced in all its forms and applications.

This view of these laws is especially manifest in the system of Wolf, who sought formally to demonstrate the truth of all that we know. These logical axioms constitute the ultimate principles on which all knowledge rests, the decisive criteria by which the credibility of all knowledge is to be tested and tried.

A new direction was given to opinion in respect to the value and authority of these principles by Kant and his followers. Kant demonstrated that as logical axioms they only respect the consistency of concepts with concepts, and as such cannot be made the sole foundations or criteria of knowledge. He showed that besides analytical judgments *a priori*, to which these principles apply in the fullest measure, there is also another class of *a priori* judgments to which they can have no possible relation. But when he made the *a priori* element in all these judgments to be dependent upon mental forms which might be only the products of the mind's own activity, he greatly weakened their force and authority.

Schelling, after Fichte had carried Kant's doctrines into complete idealism, sought to provide for our knowledge of the external or material world by asserting that we have a direct intuition, in the first instance, of the indifference of both the subjective and objective. In other words, as first known these are undistinguished or identical.

From this indifference or identity of the two, the mind develops the two opposite forms of known being. This was an entirely novel application of the law of identity, a transference of it from the logical to the metaphysical arena. Hegel sought to give this doctrine definite shape, by making *pure thought* or the abstract concept the starting point. From this, by the necessary movement of thought, he sought to develop every form and object of human knowledge. He tested all knowledge by logic, and, of course, made the logical axioms universal. But in doing so he made a special use of the law of negation and the law of identity. The relation of negation is fundamental to his whole system. Every concept is what it is by its negative relation to something else: when this negative to something else is turned back or applied to define the first it gives it all its positive and definite import: A is not B: its not-B-ness makes it to be what it is as A. The relation of identity is similarly applied. A is shown to be identical with not-B by precisely the same mode of developing and defining it. Whatever is developed from any concept is developed by thought, and in being developed from it, is shown to be other than it is; but by being affirmed of it it is made to be identical with it. In this way every object is shown in its thought-relations to be that which it is not—in other words, to be identical with it because it is conceived or defined *sy ti*.

CHAPTER IV.

MATHEMATICAL RELATIONS: TIME AND SPACE.

THE class of relations or categories which come next in order are the relations which involve the belief in time and space. They are what in our classification we have called the mathematical categories. These relations are of the most extensive application. The recognition of them is involved in every act of consciousness and perception. They are most intimately blended with one another. They suggest the space and time which are infinite and absolute—the correlates of limited time and limited space. Both space and time are invested with a peculiar mystery which seems to mock every attempt at analysis and explanation. On the other hand, the very mystery of their nature and essence serves to fascinate and hold the attention to them; the difficulty which attends the subject-matters both invites and challenges investigation. In order to relieve the treatment of the subject as much as possible, we will consider them first under their more familiar aspects and relations, and afterwards in those which are more recondite and difficult. We begin with

1. *Extension as given in sense-Perception; or the relations of matter which introduce and require the knowledge of Space.*

§ 551. All matter is known as extended. The beings or objects of which we become cognizant in the muscular and sensorial apparatus are extended. The percepts which are presented to the sensorium, as eye and ear and hand, are perceived as extended. Whether this objective and extended world is first perceived as a whole and then divided into parts, or as parts which are afterwards united into a whole, or as parts and whole together reciprocally related, it or they must be known as extended.

The extension at first blended with matter.

It is not meant that the extension in one or all of its dimensions is known at first separately from the matter to which it pertains and of which it is affirmed; nor that its several directions or dimensions are clearly distinguished; nor again that the mind is at once familiar with magnitude, form, size, and distance, apart from perceived objects, or even as belonging to such objects. Nor again is it intended that these objects of apprehension are clearly distinguished and familiarly mastered at even the first application of the attention. Frequent repetition and much practice is requisite to separate the elements which in a single perception are blended, or vaguely perceived. But these elements un-distinguished and connected, must be potentially in the object, and ready to be discerned as soon as the mind attends. Some are mastered more easily than others. One and another stands out from its background of original indistinctness, by a natural prominence as compared with the remainder. But the mind neither creates its materials either of being or relation, from itself or by means of its own energy, nor does it give validity to its concepts of either simply by inspecting objects. It simply finds what was there before, and what would at once have been observed if the attention had been more sharp and the powers had been matured. As soon as it begins to distinguish the objects or parts of the objects of its perception, it connects them at once by the relations in question.

Development of the several relations of extension.

§ 552. As soon as any matter is distinguished as such, from and by the observing mind, it is known as extended, at least in two dimensions. We cannot conceive the eye and the

hand to rest upon or to move along any so-called object without the apprehension of an extended surface. In the process by which the material world itself is broken up into separate objects, each of these objects must be known as terminating in surfaces having different directions with reference to the surfaces and positions of other objects. The ball which the infant grasps and holds is known to have an extended surface, which when followed by the eye or felt by the hand is known to return upon itself, giving as the result a *formed* object or an object having form. The cube sooner or later makes objects familiar as extended in three dimensions or directions, *i. e.*, as *high, broad, and deep*. This extension is first known as outer or as enclosing matter. But when the child peeps into a box, or surveys from within, the walls, floor and ceiling of the apartment with which it is familiar, it distinguishes surfaces as inner or inclosed by matter from those which are outer and inclose matter; the surfaces being still known as belonging to matter and not at all as separable attributes, and still less as involving relations to empty space or a conceivable void.

But the mind cannot contemplate inclosing and inclosed, or outer and inner extension, without removing the inclosed or inclosing matter, or at least without thinking of them as removed. By the child, the box or apartment is believed literally to be empty. It is void of all matter that is discernible by the senses. The outer surface of the ball or cube is in contact with no perceived matter. So far as the senses apprehend, a void or empty space is believed to envelop them. The contained atmosphere is not perceived to be material. However decisively succeeding experiments may prove that it has weight, resistance and even color, the senses do not as yet acknowledge any of these properties. In this void there is nothing, *i. e.*, nothing sensible or material. And yet this void can be occupied with matter. The box and the apartment can both be filled. Cube can be piled upon cube, ball can be laid by the side of ball till the inner surfaces are reached in every direction. More than all, within this void, matter can be moved; the ball can be dragged or thrown from one side of the apartment to the other.

Matter incloses void space. Is movable. Has place and direction.

Matter is thus perceived to be capable of being included or surrounded by other matter, or by that which is void—*i. e.*, not-matter. It is also known to be capable of including other matter or void space. Last and most important of all, it is known to be movable in space. Moreover, within the void included by matter, different objects may be introduced. When compared with one another, or with this inclosing matter, they are said to be placed or situated *here* and *there*, *near* and *remote*, etc. When viewed with respect to a person perceiving them, or an object in his place, they are *before* and *behind*. If the person or object moves or is moved, he or it is said to go or to be carried *hither* and *thither*. These give the relations of matter to matter, involving *place, position, and direction*.

All these relations are as yet known of different portions of matter as perceived. The *outside* and *inside*, the *here* and *there*, etc., etc., are only affirmed of material objects as they are mutually related to each other, and to the something which at least is not known to be matter, or, it may be, is known not to be matter—*i. e.*, not to affect the senses in any of the usual methods.

Analysis resolves these relations one by one.

§ 553. After the process of perception is complete, and all that it involves is united and built up into sense-objects and their relations, the mind proceeds to analyze these elements, and to think of them separately from any one substance, and as common to many. The color, the taste, the feeling, and the other sensible qualities are conceived and named apart in the manner already explained, and soon become familiar to the mind. But after disposing of all the qualities apprehended by sense-perception, it encounters as a *residuum* those which are suggested by the inner and outer surfaces of matter as already described. The hand experiments upon these surfaces, and finds them *rough* or *smooth*, etc. The eye discerns them as variously colored, as *light* or *dark*, etc. But no one of the senses finds what we call their *extension*. There is no sense-perception to which this is appropriate, and over against which this may be set as a quality. Moreover, this very property involves the recognition of the void to which it is conceived to have some relation. The one cannot be apprehended without the other; the assertion or recognition of the one is the assertion or recognition of some relation to the other.

Suggests many inquiries.

What is this void which we call space; which as yet is not perceived by the senses, and yet is somehow known to exist? What is extension or that property in matter which requires the recognition of space? By what powers and processes of the mind are each of these known? How are they defined when known? These inquiries remain to be answered. We may find some aid in answering them, if we consider first the attributes and relations which involve the kindred questions in respect to time.

II. *Of Time as apprehended in consciousness; or the relations of events which introduce and involve the knowledge of Time.*

Duration, how related to the acts of the soul.

§ 554. The phenomena or activities of the soul are to time, what material objects are to space. It is to these events and activities of the spirit that the relations of time are applied with the most eminent propriety. They are also affirmed of the events and phenomena of matter, and apparently with the same directness and confidence as of those of spirit. Whether this happens by the direct or intuitive action of the mind, or by its indirect and mediate operations, is reserved for further inquiry. Meanwhile, there can be no question that time and its relations pertain with eminent propriety to the phenomena which the soul apprehends by consciousness.

Every psychical act or state, whether apprehended more or less distinctly as a part of the whole series, and the entire series viewed as an unbroken whole, is known as *continuing* or *enduring*.

The acts of the soul not distinguished at first.

How soon; or whether it is by the gradual discipline or instant application of the powers that psychical phenomena are separated into distinct events, we need not inquire. The events of our inner life may seem at first to flow in a smooth and even current, or the surface may, from the first, be broken by slight ripples, that afterwards rise into clearly-distinguished waves. In either case, the whole and the parts are known as continuous or enduring. An act that is literally instantaneous, a state beginning and ending in the same instant and occupying no time at all, is absolutely inconceivable. What we call instants are not timeless, but the least knowable or appreciable portions of time. As every object of sense-perception—whether many as one, or one of many—must be known as extended; so is it with the phenomena of consciousness. Continuance belongs to each and to all. This continuance of which we are conscious at first, like the extension which we perceive in matter, is not known as an attribute or relation involving what we call void or absolute time, but is known as blended with the object of which we are conscious; constituting with the special matter of the state an undistinguished whole, separable by the attentive thought into its distinguishable elements or relations.

The continuance of two classes of activities.

§ 555. As soon and as fast as the continuous flow of these inner phenomena is broken up into distinct and separable events, the fact that they are continuous becomes more distinctly apprehended. Before it was vaguely known; now it is made the matter of definite cognition. But there are two classes of objects given to consciousness; *first*, the energy of the *ego* by which it manifests its continued, unbroken, and identical life; and *second*, the special activities which change every instant, which are clearly distinguished from one another, and attract the attention by their special force or quality. The mind knows itself the subject of changing activities—to be living and acting continuously. That which, in the knowledge of what is here called the continued life or energy of the soul, is presented as the object of its apprehension, cannot be classed with any thing besides, in the soul's cognition. It is enough to say of it, that the soul distinguishes itself from its changing and succeeding phenomena, and that it knows the *ego*—the self, the existing being as contrasted with its phenomena—to be enduring. But the soul also knows itself as acting and suffering in states that change as continuously. Some of these states may seem also to coincide with others, as one continuous or repeated act of knowledge may run side by side with two or more diverse states of feeling.

The present, past, and future.

Of the special and changing activities we are accustomed to say, We know the present by *immediate* and *intuitive* inspection, but we know them as *continuing*: the *past* activity we remember, but we remember it as *continuing*: the *future* we anticipate and believe in, but we believe it as *continuing*. But we know all the three as connected with and proceeding from the continually existing subject of them, and as by its life connected with one another. Upon this continually existing and proceeding life of the soul, all its special activities and states are *projected*, as it were; as one portion of extended matter is perceived over against the background of other matter more extended than itself. These activities thus connected are known to exist in a series involving the relations between one another of *now*, *before*, and *after*. These relations are applied first of all to the individual activities of the soul, not at all to the instants or periods of time which they are conceived to occupy, or are supposed to represent.

for these are not yet supposed to be reached by analysis or generalization. But just as we speak of portions of matter, as *here, there; before, behind; within, and without*; so we apply these time-relations to the states of the soul. As we find one portion of matter included by or including other portions, so we can cut off one portion of the continuous life of the soul by voluntary or involuntary effort, and contemplate those states which are bounded by it, either in the way of inclusion or exclusion.

§ 556. Time may seem to the consciousness to be void, as space can appear to be void to sense-perception. The mind can at least attend to a certain series only of the events of its inner life, and contemplate the rest of this existence as unoccupied by any events whatever, and yet as continuing. There can be no time absolutely void, but portions of the soul's existence can be considered as such, in the sense explained. But that time should be conceived or known as void, is not at all essential to the knowledge of events in the relations of time. We can know events as past, present, and future, by considering each of them as continuous phenomena of the continued life of the soul.

We have to do thus far only with time-relations in the concrete, and as given in consciousness. By consciousness, it will be obvious, we do not intend merely the power or the act by which the soul knows its own states as present and immediate. It includes some use of the representative power in respect to past and future events, as well as the belief that what is represented, was or will be actual. Consciousness must be enlarged to this extent of meaning, before it can connect objects in the relations of time. But in consciousness as thus defined, we clearly distinguish between what is concrete in the matter of the soul's experience—both its separate acts or stages of knowledge, feeling, and will, as well as the energy of the soul's continued life—from the time-relations which these phenomena hold to one another. These last are a *residuum* which present material for further consideration and analysis.

III. *Of the mutual relations of Extended and Enduring objects.*

§ 557. Material objects, as we have seen, are apprehended by sense-perception as extended. Spiritual acts and states are known in consciousness as enduring. But sense-perception and consciousness occur, in fact, as two elements of the same psychical energy or state. As a consequence, the relations of extension and duration are intimate and interchangeable, and the conceptions and language originally derived from and appropriate to the one, are appropriated to the other.

We do not insist that the soul can, in the same mental state, act with equal energy in each of these forms of activity. On the contrary, its force is most usually expended upon the one or the other. But however energetic and absorbing be the energy of the soul in its sense-perception of a material object, it cannot be wholly unaware that it also exercises spiritual activity in perceiving. However exclusively introverted is its gaze upon the experiences of the inner self, it cannot be wholly unaware of material and extended objects. By this obvious fact of actual experience, we explain the intimate conjunction of duration and extension, and understand how it is not only possible, but even necessary, to connect the two in imagination, language, and thought.

Duration transferred to material acts and phenomena.

§ 558. The first of these applications which we notice, is the transference of the relations of time from the phenomena of spirit, to the activities and phenomena of matter.

Duration or continuance is, as we have seen, originally discerned of the activities and phenomena of the spirit. To these the relations of time are directly and properly applied. The reason is, that when these relations are affirmed of more than one object, whether of matter or spirit, the intervention of the memory is required. We cannot say of the trotting of a horse, of the flight of a bullet, or of any other motion, that it continued so many seconds or minutes, without supposing the memory of the observer, who is all the while looking on, to translate the objects really taking place into *the objects as perceived by himself, i.e., into so many acts of his own, each enduring so much time.* Every object of memory is remembered as having been observed by the person, and is recalled by him as having been observed, and hence as necessarily bearing the relations of time. Material acts or phenomena must be connected as constituting an intellectual whole, that they may be recalled. This is further evident from the circumstance that, whatever may take place in the series of objective or material acts, that which is unobserved is totally omitted in the estimates of time. It is to the mind as enduring as though it had not been at all. It is not true that observation or memory, one or both, makes the material phenomena to endure or to require time in which to endure; but it is true that the knowledge of them as enduring requires that they be thought of by some person as occurring in his actual or possible experience. We raise no questions and make no assertions respecting objective time, or time considered apart from the experience of some spirit. We have to do, at present, with duration, *i.e., as experienced, or with objects as enduring.* We assert that this relation can neither be applied, nor thought of as applied to any material acts or events, except through the medium of the duration of some person who applies to them his own spiritual experiences as coinciding with these in fact or imagination. Every such application, when fully translated or explicated, is made as follows: "While I was thinking or observing, the horse trotted or the bullet sped so or so far."

The measures of duration taken from extended being.

§ 559. But though duration, as a spiritual experience, is the ultimate standard or measure; the duration of material events,—the actual measures of the duration of both spiritual and material phenomena,—are taken from the objective or material world. The reason is obvious. Any standard furnished from individual and spiritual experience must be so indeterminate to one's self as to be useless, and, moreover, must be wholly inaccessible to every one besides. Though, in our ultimate analysis, we say to ourselves, "While I was thinking and feeling so and so, the pendulum vibrated, the horse ran, the bullet sped so or so far," yet it is practically impossible for us to fix and render familiar any individual or often repeated series of thoughts and feelings, so as to use it as a standard even for ourselves. Even if we could do this for ourselves, we could not bring it within the reach and use of others. Each individual might perhaps be supposed to employ his own separate measure or standard of duration, but no two persons could have one that was common. But two individuals, and even two myriads of individuals, can observe the same vibrating pendulum, the same advancing or waning shadow on the dial, the same rising and setting sun, and can use these as standards to measure and mark all other phenomena, both internal and external.

It is by a natural necessity, therefore, that all the relations of time should be measured by standards and dimensions taken from extension and space. Some material thing, moving a prescribed distance, is taken as the unit or standard. It may be a heavenly body returning upon its path at supposed regular intervals; it may be the beating of the hand or the foot, each stroke being assumed to be equally long; it may be some artificial motion, as of a pendulum or balance-wheel, under the operation of gravitation or steady tension. But whatever the standard may be, it must be *assumed*, for it cannot be in any way demonstrated that its motions are uniform in their rate of time. It cannot be demonstrated, and it certainly is not intuitively discerned, that any of these motions which are considered the most accurate standards of time are uniform with each other. This assumption rests upon another, that of rational order or fitness in the constitution and phenomena of the universe; or, in other words, upon the *principle of final cause*. The certainty which is claimed for the mathematico-physical sciences in the ultimate and most unquestioned of their relations,—the sciences which are styled preëminently the sciences of observation and of fact—rests in the final resort upon this *a priori* relation of being and law of thought.

The language of duration taken from the same.

Not only are the standards of duration taken from material and extended objects, but the language of duration is taken from the same source, and for a similar reason. In fact, and from necessity, all the relations of time are expressed in terms originally appropriate to material objects, and the relations of extension which they involve. *Long, short, before, after*, etc., were first applied to material objects, and from them transferred to the relations of time. As will be seen hereafter, this is but a single example of the necessity by which the language and terms of every kind that are applied to spirit and its relations must be derived from space-objects and space-relations.

IV. *Of the relations of Quantity as applicable to space and time objects.*

Extended objects measure one another.

§ 560. Material objects are not only known to be extended, but, as extended, they are soon perceived as measuring one another. This at once introduces and explains the relation of quantity. The relation implies the act of measuring, and the discovery of an answer by some assumed standard. Quantity supposes the inquiry, *How much, How many, or, How great?* It has for its answer, *So much, So many, So large*—referring at once to some object which, in its relation of extension, duration, or number, is before or may be before the mind. The extended material universe, as at first vaguely and confusedly perceived, is unbroken, having only superficial extension. By the process of sense-perception it is soon broken into separate objects, each of which is extended. When these objects, thus separated, are again compared with the unbroken whole from which they are divided, they are known as holding to each other the relation of *parts* and a *whole*. The same is true when any portion of this extended whole is detached and subdivided into smaller divisions.

Enduring psychological phenomena do the same.

In a similar way, one or more of the separate acts or states of the soul which follow one another in a series as experienced in consciousness, may be contemplated as dividing, and yet

making up this whole, the whole of time being constituted by the continued activity of the soul in its different acts. In this way we apply the relation of *whole* and *parts* to both extended and enduring objects, the whole being, in the one case, constituted of objects adjacent in extension, and, in the other, of objects continuous in duration, which objects, thus viewed, become its parts.

Psychologically viewed, the relation of whole and parts is the first of the relations of quantity which the mind apprehends by sense and consciousness, and, as we have seen, the wholes and parts which result from the analyzing and combining acts of sense, representation and thought, belong among the *formal* relations.

Again: The adjacent surfaces of extended objects are observed to coincide in one of their terminating limits, either when two objects are placed closely upon one another by the hand, or when two are held at different distances, so as precisely to cover one another to the eye. If, in either case, all the extremities coincide, one of these objects measures the other, and is equal to it. If one extends beyond the other, it is greater; if it falls short of it it is less. The same relations would be affirmed of two or more spiritual states as enduring, if they should be actually experienced together in consciousness, supposing this were possible, or if they were simply conceived so to occur. We speak of periods of time, when thus compared, usually as longer or shorter than others, or as equally long or short with another, in terms taken from the dimensions of space. We also speak of more, or less, or equal time, in those designations of quantity which are common to both space and time objects, and are acknowledged to be equally appropriate to either.

It will be noticed that, in order to measure one extended surface by another, the two must be in fact, or appear to the eye to be in one plane. You cannot measure a plane by a spherical surface, nor a circular by a straight line. You can measure only the planes which each present to the eye. Direction in some sense is also implied. You must move the measured object evenly in a plane, or move it towards some defining limit, which must be kept steadily in view. Inasmuch, however, as the eye leads in the sense-perceptions, and to the eye at first all objects appear in one plane, direction need not at first be a matter prominently considered.

Measurement
requires num-
ber.

§ 561. These examples explain how one extended object or enduring act of spirit may measure another by the relations of equality or greater and less. Measure, in another meaning, supposes the application of number.

The relation of
number, how de-
veloped.

This relation may be developed so far as to be applied to these uses, as follows: *First* of all, some object must be selected which shall serve as the unit, which at the same time can be conveniently repeated as an equal part of a whole of extended objects, or of a series of enduring mental states. Let two objects of equal extent of surface be placed one upon the other, and be seen to be equal. Let the one be then placed adjoining the other, and made to coincide with it in the same plane; or, which is the same in effect, let a single object be moved before any background, and successively cover and reveal portions equal to itself, and we have at once complete occasion for the use of number in measurement. Two equals side by side in a plane, car

be counted if, the mind contemplates the one after the other in the order of time. That with which it begins is the first, or 1, of the series. The next, when connected with the one taken first in time, is second, or 2. When another is thus connected, we have the third, or 3, and so on. Thus we count, or number. But to count, or number, is only possible as we connect objects by a consecutive series of mental acts—that is, by a series of mental acts following each other in time.

Relations of
number.

The object which thus divides into equal parts an extended whole or a continued series, whether the divisions are permanent, or momentary, is called its measure. When these parts are connected as following one another, by the sustained attention of the mind, the parts are numbered as well as measured.

The relation of
number defined.

§ 562. The relation of number is complex, and requires that objects should be connected in series as wholes and parts, and contemplated in the relations which are derived from the time-relations of the mind that views them. It is clear that we cannot number without cognizing objects as connected as wholes and parts, by the mind's contemplation of them in a series of acts distinguished and united as enduring in its own subjective experience. In other words, number depends upon those relations of time which we assume and know to be inseparable from the soul's own activity.

When a series of mental states is itself measured and numbered, it must be remembered that in reflective consciousness the series itself is made objective to the mind. It is treated or viewed as though it were a series or whole of material objects. In such a case it is itself contemplated by a new series of acts which, as necessarily consequent in the mind's subjective experience, both require and furnish the relations of number which are forthwith applied to the object-series before it. It makes no difference what this object is, whether it is an object-object or a subject-object. It is contemplated by a series of acts wholly subjective, involving as spiritual acts the attribute of duration to themselves, and as *successive*, the relation of number in the objects which they unite and measure as wholes and parts.

Thus far we have to do with the relations of quantity as known in the concrete, that is, as applied to actually existing objects. We have seen how one portion of matter or one act or state of mind can be applied to measure another or others, in the way of magnitude and number. We have also seen that we cannot measure extended objects or connect spiritual states without numbering them. How these can be conceived as pure quantity or quantity in the abstract, will be considered hereafter. (Cf. § 569).

V. Of extended and enduring objects as Imaged or represented: or space and time objects as enlarged and measured by the Imagination.

Limitations of
sense - per-
ception.

§ 563. Only a small portion of the material universe is apprehended through the senses by any single act of the mind. The hand can cognize an object of only equal extent

with itself. The eye has a far wider, but still a very limited range. All beyond either, is apprehended and measured by the representative power. Even within the limits to which the eye reaches, and upon those very objects which the eye seems to command, the representative power is largely employed in estimating extent in the dimensions of distance and size.

That which is before the eye is the utmost which the eye can in any sense be said to perceive, and very much of this extent is estimated by the mind's eye. If we change the point of view with the swiftness of the flying bird, as fast as we see a new extent of objects, we lose sight of those present an instant before. The sailor who is driven before the wind, finds himself, every morning, apparently in the same place as the evening previous—in the centre of a circular lake bounded by the line made by the sky and the sea.

Within these limits we divide as we please. Within these limits, whether the observer is fixed or in motion, this extended whole can be divided according to the convenience or the caprice of the percipient. Nature has given fixed or moving boundary lines, by the various properties of the undivided and separable, of the stationary and moving objects with which she fills every visible scene. The objects within the reach of the hand and the direct inspection of the eye, we measure by selecting some one as a unit, in the manner explained. Those beyond these bounds, we measure in a similar way, with this difference only, that the material measured, and the standard by which it is measured, are furnished by the imagination only, working upon the suggestions or occasions which perceived objects furnish. We seem to perceive the real height of the lofty tree that shoots up from the horizon against the sky, while it is but a mote to the eye; we think we perceive the width of the stream that threads the distant meadow with a silvery line, but these estimates are possible only by the aid of the picture-making power, that brings them by the side of the tree under which we stand, or upon the margin of the stream where we sit. We have already learned, in considering the acquired perceptions, that it is only by the aid of the imagination that we supply the defects of the senses, and interpret their indications.

Beyond these we use the imagination.

§ 564. Beyond the limits of actual perception we are dependent upon the imagination alone for our estimates of distance and size. These estimates, within and beyond the reach of experience, vary with the actual knowledge which we have gained of such objects by inspection and recall by the memory, and with the practice which we have gained by the frequent application of definite standards by the representative power. The adult surpasses the child immeasurably in this power. So does the man of various observation and of disciplined powers excel the man of limited knowledge and of untrained habits; so most strikingly does the modern, instructed and taught as he is, present a very striking contrast to the wisest of the ancients.

How the child imagines distant objects.

The child, uninformed and immature, has very scanty materials with which to fill up or extend the background of the scene that is within reach of its perceptions, and but little interest to excite to their use. Hence its estimates of the place, distance, and size of the objects that are remote from its reach, uninteresting to its feelings, or unfamiliar to its handling, are singularly confused, capricious, and uncertain.

A child between three and four years old, of no inferior intelligence, and of good oppor

unities for instruction and thought, was once asked how far distant the sun sets, and answered promptly, In the next field. The answer expressed the first impressions of every child, and clearly illustrates the little exercise to which the childish imagination is disciplined in the way of filling the interval that lies between its home and the visible horizon. This child had walked and driven for miles in every direction from its home, and would have remembered, and declared if prompted by a leading question, that all the roadways along which it had gone were bordered by adjacent houses, fields, and gardens, like those in sight; but it had never learned familiarly to think of these as filling up the space, or to estimate their relative dimensions. Beyond the bounds that shut in the nearest and the most familiar objects, its imagination had rarely acted, and all the wide universe without was to its fancy and its judgment almost a blank. In the same way we account for the incapacity of a child to conceive intelligently the length of a road or the extent of a journey.

The uncultivated man.

Very like the immature child is the uncultivated man, especially if such an one is fixed, by his habits of life, to a single narrow valley or a limited range of travel. Every thing beyond is confused and unmeasured. The horizon of his actual perceptions, or the slightly enlarged horizon of his expeditions for hunting and war, includes all that he knows or soberly imagines. He may at times fill the blank vacuity beyond with objects that are monstrous, horrid, and grotesque—objects that are terrific to his unintelligent fears, or are bewildering to his insane expectations; but he fixes few or none which hold definite or rational relations to others as measures or bounds. The spatial world formed by both child and savage, is well represented by the rude maps of the early geographers, in which the countries actually traversed are drawn with a certain degree of definiteness, though the near is out of all proportion to the remote; while all beyond is a blank, bounded by an uncertain line, along which uncouth monsters are placed, or the unknown and measureless water or desert shuts in the picture.

If the child or the savage attempt to picture and measure the regions of the sky, or to estimate the size and distance of the heavenly bodies, the processes are still more uncertain and the results more indefinite and vague. Both soon tire of repeating any familiar object selected as a measure. They neither think nor care how large are the sun and the stars, or how many are the steps, the miles, or leagues, which would be required to reach them. Thus and thus only can we explain the very inadequate conceptions on these subjects which the early astronomers accepted and taught.

Measures of time-objects imaginary.

§ 565. Our conceptions and measures of time-objects, like those of space-objects, are largely the work of the representative faculty. The passing and present acts and states of our own spirits, and the coincident operations and phenomena of the material world are the only time-objects of which we have direct cognizance. Past objects are gone. Future objects do not yet exist. Present objects alone directly confront the mind. The past must be recalled by memory, the future must be anticipated in the imagination, so as with the present to complete the series of time-objects.

The standards by which we measure these objects, whether present, past, or future, are of two descriptions. They are taken from the material world, in the motions of certain objects which are assumed to be uniform, or from the world of spirit in some longer or shorter period of our own existence, which, with the feelings attending it, is made the standard. We may distinguish these standards of space and time as definite and indefinite.

Different capacities in different men.

To measure past events, we must be able to recall them in their order, as as to have before us the material which we are to estimate. But men differ greatly in the capacity to revive past objects in their fulness and order. If the capacity to recall with success be possessed, time and effort must be added that any past series may be restored, so as to be estimated or measured. Some self-discipline and practice are required that a measure may be prepared from our inner experience which shall be ready for use, and also that the same standard shall be applied on the occasions required.

Differences in the estimates of time.

Differences in both these particulars in different persons, and in the same persons at different times, account for the singular differences which are notorious in our estimates of time. No fact is more generally accepted, than that two series of events may occupy the same length of time as measured by the clock, and may seem to vary very greatly from one another as measured by the mind. If we are waiting impatiently for the arrival of a friend or of a railway train—if we are listening to a tiresome conversation or a tedious lecture, the time seems very long. On the other hand, if the conversation is interesting, or the pastime is absorbing, the time flies swiftly along. The child cannot believe that the hour has come which calls him from his play, to school or to bed. A trip by a steamer seems much longer than a trip by railway, when the time is the same. Each are sensibly shortened if the tedium is beguiled by spirited conversation. A week spent in the daily routine of regular employment, goes quickly by; while a week of constant travelling, filled up by a rapid succession of exciting objects, often seems surprisingly long. The years of childhood glide slowly away. Every day and every month stretches to an interminable length, because our present enjoyment brings no disappointment, and because it stands between us and some future enjoyment which the mind is impatient to grasp. The years of our busy middle life slip hastily by, though we would fain delay their flight, because we are too busy to measure the passing years.

Estimates of space and time in dreams.

The estimates which we make in dreams of both space and time, are singularly capricious. They strikingly illustrate and enforce the truth, that these estimates depend on the subjective judgment of the soul, and these judgments are capable of extraordinary variations, from merely accidental causes. A dream which takes but a few minutes, suffices for a long journey or a tedious voyage, for a protracted entertainment or a prolonged and painful contest. We seem to ourselves to pass through weary hours of prolonged suspense, to experience manifold struggles and disappointments, to climb lofty eminences by a series of vain efforts, to apply ourselves again and again to fruitless tasks, and the time which we spend and the spaces which we traverse are stretched almost to infinitude.

Measurements which involve number and magnitude.

§ 566. The constructions and measurements of space and time which we have thus far considered, are not to be confounded with those which involve the relations of number and magnitude. They are made for practical use and convenience, and rest upon those comparisons of one series of objects with another which give general impressions of their time or space relations, or the application of some familiar object or series as a standard by which to measure one that is freshly presented. They do not involve any great precision or an exact record. In the most of these cases, the relations of time and space are not the sole, perhaps not the prominent matter of interest. The mind judges the time spent in one occupation was about as long as the time spent in another. It took me about as long, or twice or half as long, as to do this or that daily duty. The distance from A to B is equal to the

distance from C to D, or it may be greater or less. But when we say London is 3 to 4,000 miles from New York, or the moon is 238,650 miles distant from the earth; or Washington and Napoleon were born and died so many years after the birth of our Lord, we apply measurements of a different character. These are what we have styled the definite standards of both space and time.

It is interesting to notice, in this connection, the history of the progress made by the human race in the standards of both time and space. The savage measures time by the budding of the oak, or the return and departure of birds or other game. By and by he marks the coming and going of the moon. Then rude devices like the clepsydra or the sand-dial are introduced. Last of all, the scientific observer employs the chronometer and the astronomical clock.

So, in standards of length, the mind has passed from the use of parts of the body, to measurements by the aid of the pendulum, or a portion of a circle of the earth, in order to find an accurate and trustworthy standard.

The first question that presents itself in respect to these standards is, What are the conceptions of a minute, an hour, a day, a year, a yard, a rod, or a mile, which, in such cases, we speak of so freely and apply so readily? Are they images or concepts? Are they individual or general, or something between the two? We answer, They are both images and concepts, or imaged concepts, and are the products of both imagination and of thought. So far as they are products of the imagination or the representative power, they fall within the present section.

Standards of both space and time are images or representations of material objects. No images can be formed of space or time as such, or of what are sometimes called pure or empty space and time, but only of those objects or events which hold a relation to either or to both. When these are pictured or imaged, they carry with them those relations which the originals necessarily involve, and from which they cannot be severed in reality or in thought (§ 424).

Objects and events can be represented or pictured with the greatest possible fulness or vagueness. If not really present, they can never equal those which are subjects of actual experience. They can rise very nearly to that freshness and fulness which present perception and immediate consciousness can alone apprehend, or they can fade and sink away to that dimness which simply suggests that certain portions of space and time are covered or occupied by them. In forming these representations of pure and empty space and time, the mind has only to fix its limits nearer or more remotely, more widely or closely, and leave the interval between wholly unoccupied by either objects or events. As in forming images of objects actually perceived or experienced, it can make them full or scanty, vivid or faint, so it can leave unpictured every thing except the bounding limits themselves, and these it can picture with only the distinctness required to suggest the space and time between. But even in all these cases some definite and individual object is imaged. But with the object itself, as such, the mind is little concerned. It only employs and cares for it as it suggests the space and time to which it is related. Thus, for a standard of space, the words *yard*, or *rod*, or *mile*, may call up some visible or tangible object most indefinitely pictured, or with the words, a *minute*, an *hour*, a *day*, or *year*, some series of events that have required a remembered period, or a part of such a period. Both these are pictured, not for their own sake, but for the sake of the time or space which they suggest. But these standards are concepts as well as images, and they cannot be completely understood, even as images, till they are considered also as concepts. This leads us to the next topic.

VI. *Of space and time objects as Generalized; or the Concepts of the relations of objects to time and space.*

How the relations of space and time objects are generalized. § 567. Different individual objects and events hold similar relations to both space and time, whether they are presented to sense and consciousness, or are represented to the imagination. Space-objects may be alike in relative position, distance, form, and size, etc., Time objects may be alike in coexistence, in antecedence or subsequence, in their relative place in the order of occurrence, and in the intervals by which they are separated from one another or from any other event. The mutual relations which exist between time and space objects may also be common to any number of both classes. These relations are as readily generalized as are the attributes of material or spiritual things. It is as easy to generalize the forms and sizes of objects as their color or their taste, the *beforeness* and *afterness* of a spiritual act, as its quality as an act of knowledge or of feeling.

There is this difference: these relations are in their nature incapable of being directly picturable to the imagination, as are the properties of matter and spirit. In order to represent them at all, we must first picture the objects which hold them, and so recall or suggest the relations themselves. As concepts these generalized products are as easily formed and comprehended as any other concepts. They are peculiar only in the relations which they bear to the individual things and events of which they are affirmed, and to the representations of those things and events by which the concepts are imaged.

These relations individual and general. § 568. The words by which these relations are named and known, are as truly generic as the terms usually called common. It is true, these terms are usually called terms of relation, but this makes no difference with their character. All of them, it is true, have a more or less direct relation to an individual place and time, and seem therefore to be less general than the other appellatives; but they are all capable of being equally applicable to many individual objects, and hence are as truly generic as they. We cannot say *here*, *there*, *now*, *before* and *after*, without implying that an individual observer occupying an individual place at an individual portion of time apprehends the object in this very relation, but it is possible that many objects at different times may be *here* or *there*, and *now* and *then*, *before* and *after*, i. e., at the same time in different places. Hence the *hereness* and *thereness*, the *nowness*, the *beforeness* and the *afterness* may all be common to many individuals, and like sensible or spiritual qualities may be affirmed or predicated of all. Hence these objects may be grouped under, or classified by means of these general relations. Hence the terms which denote them, take their place side by side with the other common terms with which we are more familiar. Very many adjectives of time, as *prior*, *later*, *present*, *past*, and *future*, and of space, as *long*, *short*, *high*, *deep*, and *broad*, and of form, as *circular*, *triangular*, *square*, *spherical*, and *conical*, and of motion, as *swift*, *slow*, etc.

will occur to any thoughtful mind as belonging to these classes of words.

All these classes of terms, like all other notion words, require some image to explain and illustrate them to the mind. But they are peculiar in this, that any object whatever will serve to image some of these terms, and a very large class of objects will serve to illustrate others. Every object in nature and in spirit has some relation to time and space, and hence it is indifferent what one is cited to exemplify these universal relations. Other time and space relations, though not universal, are much more extensive than most of the usually recognized appellatives. It is much easier to recall an example of an event that is early or late, or, an object that is spherical or oval, than of the majority of the common terms that are most frequently used.

VII. *Of Mathematical Quantity; the process by which its concepts are evolved, and their relation to time and space.*

Two classes of mathematical concepts.

§ 569. These concepts naturally divide themselves into two classes, the concepts of magnitude and the concepts of number, or the concepts which are related severally to space, and time. We begin with those which imply the existence of space, as being the most easily explained and understood; i. e., with geometrical concepts or concepts of pure magnitude.

How geometrical concepts are originated.

Of these the most familiar are *the point, the line, the surface, the triangle, the square, the rectangle, the rhomboid, the solid, the cube, the sphere, etc.*

These terms stand for both images and concepts, in other words for the products of the imagination and of thought. As images they are individual, as concepts they are general. The representative imagination recalls sensible objects and phenomena with their relations to both space and time. It is impossible to view the one and omit the other.

The creative imagination idealizes not only the sensible and spiritual properties of these objects and phenomena but it idealizes their space and time relations, § 353. It transforms the perceptible edge with its actual breadth and ragged outline into the ideal line which has neither breadth nor undulation. It smooths the undulating surface into an evenly lying geometrical superficies. In the same way it refines the blunted corner of a die or cubical block into the mathematical point which is imagined as having place but no extent in any direction. These relations cannot themselves be thus imaged without the aid of some concrete object, but the object itself can be imaged with these relations thus idealized and refined. When the attention is withdrawn from the object related and occupied with the relation in question thus idealized, the relation itself is said to be imaged. This act of fixing the attention is an act of analysis, preliminary to the act of generalization. But when the relation is generalized, we have a concept in place of an image, holding the same relation to the concrete and individual which belongs to any other concept. That is, these concepts need to be imaged and illustrated by concrete objects as truly as do others. Their import can be understood and their validity established only by this process. As has already been explained, § 453, their superior clearness and intelligibility as the materials for definition and deduction can be accounted for by the readiness with which the mind can recur to their import by citing some individual example, and can be sure that it has considered every one of its possible relations.

Rest on what
assumptions.

§ 570. All the geometrical conceptions are dependent upon the assumption of the space-relation of objects. Without these space-relations they have no meaning. They presuppose the belief in these space-relations, as actually belonging to every material existence. They rest upon the belief in that absolute and infinite space which limited space presupposes and involves. Space with the space-relations of objects, is the ever-assumed background upon which all geometrical constructions are projected, and over against which all its processes are interpreted. Its presence is not expressed in language, but it is constantly recognized by the mind as essential to the intelligibility and the application of the definition, and proof. A line, a point, etc., are *no-things*, they are incomplete and impossible conceptions except as space is supposed and supplied by the mind as that in and by means of which they can be constructed and conceived. These truths are too obvious to need further proof or illustration.

Postulates of
Geometrical
quantity.

The vouchers for the reality and the validity of these conceptions are to be found in the mind's own power to construct them. The mind knows that it can construct these concepts, and knows what they are when constructed. Geometry postulates of every student that he should make them for himself. The language of these is, "*draw a line*," "*conceive or construct a plane*," "*think of a point*." It lays the foundations for its reasonings in these postulates. It defines the meaning of these constructions by analyzing their relations to one another and to the space to which they all have a common relation. It illustrates, or as we usually say, *demonstrates* the relations unknown before by referring to new constructions made concrete in some material substance, for example, by a cube or sphere, a cone, a dot, a chalk line, a rough surface on blackboard, or paper included by marks—which are no mathematical lines but serve to represent them and hold the attention to what they represent. In the so-called demonstration of Geometry one figure is supposed to be drawn in connection with another. Additional figures are placed by the side of those already constructed, or those already drawn are divided so as to enable the mind to bring into comparison figures that had been inaccessible and incommensurable. But as it is with the original and simpler definitions or postulates so is it with these complex constructions. Space is supposed as the necessary attendant of each and of all, making it possible to construct them and to evolve the new relations which the mind discerns by skillfully preparing and combining the required figures. As has already been shown, § 457, the nerve and force of the geometrical demonstration rests more upon these successive intuitions than upon that element in it which is properly deductive.

Conditions of the
concepts of num-
ber.

§ 571. *The concepts of number* are conditioned upon certain relations of objects and phenomena to time. Objects to be capable of number must be contemplated in a continued series. This only is possible by the known and recognized relation of such objects to the mind's continued or sustained action as it contemplates them in succession. They must also be viewed reciprocally as wholes and parts. This is possible only as the mind gathers objects viewed as arranged in a series into a group which it breaks up into parts, reuniting these parts with each other at its will, making its units larger or smaller according to its caprice. To both these relations time is the necessary

condition, to the continued subjective act of the mind in connecting objects into a series, and to the recalling of them as thus connected, so that they may be arranged and grouped as wholes and parts by the successive additions of units.

It has been already shown, what it is to number or count, and that to the act of counting, time must be assumed as both the subjective and objective condition. The relations by which objects are viewed or connected in the act of counting when abstracted, generalized, imaged and symbolized, are the relations of number.

Relations of number can be symbolized by any objects.

These relations can be applied to any objects whatever—to material objects, to spiritual objects, to acts or states of the mind itself, to the very acts of the mind in numbering, in short, to any thing which can become an object of direct or reflex cognition. Any series of objects can be used as the symbols or images of number. We may use objects most unlike one another, contemplating them only in their numerical relations, or we may select those very nearly alike, and presenting so few points or features of interest as not readily to distract the mind from the single relations conditioned by time. Thus a row of marbles, of kernels of grain, or a series of marks is usually selected. Such objects can be readily interchanged with one another, and therefore suggest little more than their numerical relations. For convenience of recording and recalling the results of the processes of counting, arbitrary symbols have been selected. Thus, for two objects made one by a single addition, we employ the symbol of two marks, as in the Roman system, II, later, the Arabic character 2; then III, 3; then, instead of five marks we use V *Rom.* and 5 *Ar.*; instead of four and six, V diminished by 1 going before, and increased by 1 following, or the Arabic characters, 5 and 6, etc., etc.

The principal concepts of number.

§ 572. The principal concepts of number are *the unit, the sum, the difference, the multiple, the divisor and the ratio*. For our purposes these need not be separately and carefully defined. It is sufficient for us to notice that they stand for the relations of objects as viewed in a continued series, *i. e.*, contemplated as parts that can be augmented by a constant addition, or repeated one by one or group by group; or, again, as a whole that can be diminished by a constant subtraction, or be separated into equal parts that are themselves more or less numerous.

These concepts cannot be so readily defined as they can be imaged and exemplified. To explain and illustrate what they are we must take objects and count them. Their meaning is originally taught and repeatedly explained by the directions, do so and so with them, take objects and count them thus and thus. In other words, they rest upon postulates as truly as do the concepts of geometry. They assume that the mind can perform certain thought-processes which result in certain thought-products. The psychological conditions of these processes are distinguished objects, whether material or spiritual. Their logical condition is the reality of time-relations, and of time itself as making these relations possible. That number depends upon and implies time, is obvious still further, from the language which we continually use in our definitions and analyses. We say, add this so many times; ten taken twice, *i. e.* two times ten, is twenty; ten divided one time by five, or diminished once by three, is respectively two and seven.

The application
of number to
magnitude.

§ 573. The *application of number to magnitude*, or of the concepts of discrete to those of continuous quantity, depends on the mutual relations of time and space objects which have already been explained, § 557. If number can be applied to the parts of space and time in the concrete, so that one can measure the other, then the concepts of number can be applied to the concepts of magnitude, for both of these are resolved into and explained by their origin in individual time and space objects. We take any portion of space as a whole, we divide it into parts, we number these parts, we discern ratios between them. We express the powers of curves by their equivalent formulæ of lines, as symbolized by numbers, creating all those conceptions and performing those processes which modern analysis has discovered and applied.

VIII. *Of the application of mathematical conceptions to Material phenomena.*

Why, and how
far mathematical
concepts are
applicable to material
objects.

§ 574. Thus far we have considered the pure mathematics. Pure geometry seems to deal only with ideal constructions in ideal space, and pure arithmetic and algebra with ideal concepts conditioned by abstract or ideal Time. How can it be possible to apply these ideal creations to material things and sensible phenomena? To this general question we give the following general answer. These concepts of number and magnitude, are all generalized from the individual relations of concrete objects and events to both space and time. We cannot explain or understand them except as we go back to such objects and find them realized in these. In the order of time and acquisition we know applied number and applied magnitude before we know pure number and pure magnitude. The latter are always explained by the former.

Moreover, as number and magnitude are in a certain sense idealized when they are affirmed of concrete objects, and the mind discerns a difference between the ideal and the real, so is it when these concepts are generalized and the inferences from them are reapplied to these objects. We do not expect that they will exactly conform. Certain properties of matter were necessarily left out of view in forming such concepts. These must all be considered and brought into view to modify our ideal inferences. In estimating the velocity of bodies we consider them as capable of constant force and of accelerated motion, the force being manifested in, and estimated by motion. When we compare the results of our mathematical processes we do not find that they hold good. Why should they? Our data were ideal. They assumed what rarely if ever actually occurs, *i. e.*, a force entirely constant and equable. Or if this were real, certain properties or attributes of moving bodies were omitted in our estimate of the result, *e. g.*, the increase of resistance with the increase of velocity.

Example in Mechanics.

In *Mechanics*, bodies are viewed as attracted by gravitation, as held together by cohesion, as impelled by a natural or artificial agency, as capable of both force and motion, as acquiring and losing velocity. But gravitation, in these concepts, is idealized as a constant force manifested in motion, the rapidity of which is inversely as the square of the distance. The nature of gravity itself as a material agent, is not considered, nor that of *inertia*; nor is the resistance of intervening media, but only the simple fact of motion, or a tendency to motion, with certain constant relations to space and time. In like manner cohesion is conceived as manifested in the phenomena of motion. So the laws and properties of bodies in motion and pressure are expressed by space and time relations. Whether bodies do in fact move or tend to move with regularity in these relations so that their motions can be measured and computed, are facts that can be ascertained and vouched for by observation and induction only.

Newton's great laws of Mechanics.

In illustration of this we observe that Newton's great laws in respect to the causes and continuance of force and motion are all generalized observations of facts of sense enforced on grounds of high probability. In other words, they are grounded upon induction. These laws or facts being assumed, we reason and compute with respect to the direction and rate of bodies in motion, with respect to the pressure and weight of bodies tending to move, and with respect to the results of bodies conspiring together in motion, just as we can reason or compute with respect to a sizeless or weightless point that is supposed to move in a breadthless line. That is, we apply to these material objects the concepts, relations and laws of the pure mathematics. But when we compare the results of our computations and demonstrations with bodies actually existing and phenomena actually occurring, we find that the two do not coincide. When we find that the prophecy given by the demonstration or computation is not fulfilled by the *facts* of the velocity, weight, or pressure of the material bodies with which we come in contact, we account for the discrepancy by those elements or properties which we were obliged wholly or partially to disregard, such as inertia, resistance, friction, and the like. In many cases these are so unimportant that we subject them to no estimate, but take the result as exact enough for our purposes. In other cases, as in gunnery, astronomy, and the working of machinery, we seek to express the value and effect of these very forces in mathematical concepts and formulæ, and subject them to mathematical computation, according to the principles and methods which had been applied to the prime forces.

All material objects susceptible of mathematical relations.

§ 576. As all material objects must of necessity hold relations to space, and all material events or phenomena relations to time, and as our perceptions of each must be formed in some order of time, it follows that they all are susceptible in some sort of mathematical relations. The tendency to seek and expect regularity and uniformity in these relations was very naturally suggested and very early developed to the thoughts of men. It was natural to believe that the heavenly bodies which moved, or appeared to move, advanced at regular rates of speed and returned to their starting places at uniform intervals of time. This expectation prompted the earliest observations of astronomy, and its conclusions rest on the inductions which this speculation excited. When the phenomena of matter began to be accounted for by their causes, and the active agents or forces of nature were ascertained, it was natural to believe that these several efforts and products were obedient to and dependent upon the mathematical relations of the working of these causes, either their quantity of matter, the rate of their motion, or both of these combined. Exact observations and careful experiments confirmed the truth of these anticipations in respect to many phenomena, and in this way was evolved what are called the laws of mechanics, both on the earth and in the heavens. The successful discovery and establishment of one mathematical law after another by Galileo, Kepler, Newton, and Laplace, greatly extended the domain of this kind of knowledge.

Applications to chemistry.

When the agents or elements of the new chemistry were discovered, and their nature determined, as oxygen, hydrogen, etc., and when many well-known substances were decomposed into these and kindred elements; when, also, the reality of chemical union and chemical products was vindicated, the bright thought of the mathematical Dalton that these agents unite with one another in constant weights of atoms or volumes of gas at the same temperature, introduced a luminous order into the whole sphere of chemical science, and subjected its wonderful phenomena to the control of definite mathematical laws. Upon this

conjecture, verified into a discovery, rests the precise nomenclature of the later chemistry and its compact and almost algebraic symbolization.

As the consequence of these remarkable discoveries of a rigid obedience to mathematical law is the most poetical of the physical sciences, the impression was confirmed in the minds of many students of nature, that we ought to expect and seek for the observance of mathematical relations in every department of matter, even in those material conditions on which psychological phenomena depend. It was early discovered that the quality of harmonious musical tones emitted from a stringed instrument depends on the length of the strings and the coincidence of their vibrations; that when the string on being struck springs backward and forward in the same or proportional times, the sound which pleases the ear is the result, while if the times or fractions of times in these vibrations fail to correspond, discordant and displeasing tones are certain to follow.

By and by, light, or the material agent or condition of vision, was subjected to scientific thought and inquiry. It was first conceived to be a material substance, the particles of which proceed in right lines from all luminous and illuminated bodies, from which lines they are reflected and refracted by material agents, so as to produce the effects, or, more exactly, to furnish the conditions of vision. To these processes of reflection and refraction, mathematical relations and formulae were at once applied with the same propriety as they had been previously used to explain the motions of other bodies. As the phenomena corresponded to these mathematical formulae, the formulae themselves were accepted as their established laws, and the laws of light as expressed by mathematical relations took their place among the laws of other material bodies. When the theory of undulations was suggested, and the phenomena of light were supposed to admit of a more satisfactory explanation on the supposition of the excitement and propagation of a series of wave-like motions in the matter of light, the mathematical relations proper to such undulations were at once brought into requisition, and formulae appropriate to undulating motion were accepted as expressing the laws of light.

The material conditions of hearing, or the agent or element of sound was tried in its turn, partly because of the laws which were known to attend those vibrations that yield musical tones, and partly because of the success which had been achieved in explaining by mathematical relations the phenomena of light. The theory was soon accepted, that these relations are also applicable to the science of acoustics.

Next in order it was suggested, that the sensations of heat can be explained upon the theory of the more or less rapid vibrations of the particles of matter that are occasioned by the subtle agent or influence which is called caloric or heat, if its vibrations are subject to regular, *i. e.*, to mathematical formulae and laws. Whether heat itself is only a form or mode of motion, so that the phenomena can be resolved into moving particles, or whether these regular motions are only the attendant signs of the presence of a specific agent; it is almost an accepted truth that the laws of heat can be expressed by formulae appropriate to motion.

The attempt has been made to account for the conditions of taste, smell, and touch by the vibration of material particles in objects as responded to by the vibrating nervous substance, but no facts or laws have yet been adduced which give to this attempt more than the semblance of success.

The suggestion has more than once been confidently urged, that the varying phenomena of the whole physical universe may be resolved by supposing masses or particles of matter either moving or having a tendency to move according to fixed mathematical relations. It is obvious, as has already been observed, that every material object, whether a mass or a molecule, is capable of holding certain relations to space and time, and is thereby capable of those relations which are called mathematical. In this we find provision for the possibility that matter, in all its phenomena, should act according to mathematical formulae. This possibility was conceived by one of the earlier philosophers to be a fact, when he asserted that number rules all things, and that harmony, rhythm, and even music pertain to the motions of the heavenly bodies. Plato, in a moment of sagacious insight reaching almost to inspiration, exclaimed, God geometrises. He said this with confident enthusiasm, indeed, yet not without decisive grounds of reason, for he could not believe it possible that the Great Architect, if he could construct and move the universe according to the relations and laws made possible by space and time, should avoid doing so. To establish this conjecture into a fact has been the slow work of science during the centuries that have intervened, and its work is not yet complete.

It is one thing to believe, and even to prove that all the laws of matter can be expressed in mathematical formulae, and another to ascertain what these formulae are. It was easy to believe with Pythagoras that number must rule in the universe, but it required the close observation and experimenting of centuries to bring the human mind to a standpoint from which it could determine the numbers according to which chemical elements unite and are decomposed. So also it was natural, and almost necessary, for Plato to believe that the Architect of the heavens built and moves the celestial bodies by geometrical relations and laws; but it

required the observation and thought of Ptolemy, Copernicus, Galileo, Kepler, before Newton and Laplace could fix the laws and formulæ under which the geometry of the heavens is now comprehended and expressed.

IX. *Of the application of mathematical relations to Psychological phenomena.*

Application of
mathematics to
the science of the
soul; arguments
for it.

§ 576. An earnest and persistent effort has been made to subject the phenomena of the soul to mathematical formulæ and relations, similar to those which hold good of material objects and agencies. The grounds or reasons for this attempt are: *First*. Analogy would lead us to suppose that the media by which alone material phenomena are satisfactorily explained, may in some way or other be employed to account for the phenomena of the soul. *Second*. There is a large and important class of mental phenomena which seem to act according to the general methods which govern the phenomena of matter. Such are those forces which regulate the return of objects previously known, as in memory or imagination. These objects, or the mind's impressions of them, seem to be endowed with a force or tendency by which one struggles with another for the mastery, like mechanical or chemical forces, and the question which shall prevail is determined by the preponderant strength of one over the other. *Third*. If we cannot apply mathematical relations to psychological facts, then we cannot reduce these facts to science at all. Mathematical relations are the essential conditions of scientific knowledge. In the earlier stages of scientific knowledge, facts explained and arranged by their conditions and causes might be called science, but it is not so at present. The expression of laws by means of mathematical formulæ, is essential to constitute any species of knowledge scientific.

Arguments
against this
view.

Over against these considerations may be urged the following. *First*. The analogy between material and psychological phenomena is too remote or feeble to warrant the inference in question. As we pass from the one to the other, we are more impressed by the differences than we are by the similarities that present themselves. We are justified in the inference that much may be true of the one which cannot hold good of the other. Again, we observe that the higher psychical phenomena, those which are preëminently and distinctively spiritual, are peculiar in this, that in them the soul exerts an agency which is self-active and free, and in this is totally unlike those which are passive and inert. In these higher functions there seems scarcely to be a feature of likeness with the phenomena to which mathematical or material properties belong. Take the act itself of apprehending mathematical relations, and of measuring material force by means of them, or acts such as those by which Plato or Pythagoras surmised, and Newton or Dalton demonstrated that these relations give laws to the material universe. Can it be conceived that such an act should itself be the result of psychical forces acting according to these very laws? If so, then by the operation of forces acting according to mathematical laws are evolved the convictions that these laws hold good of the universe. *Second*. The psychical phenomena which are in any degree analogous to those material forces which are mathematically determined do not and cannot exist or move in space, and therefore are incapable of any known or estimable relations to space. All those forces which are measured by mathematical relations are spatial in their action. It is impossible that mental forces or phenomena should come under similar relations. The conceptions and relations by which they are conceived as moving, striving against, excluding, and repressing one another, are figurative expressions arising from the necessities of language. They cannot be pressed to a literal construction. Inasmuch, then, as these forces have no relation to space, one of the essential conditions of mathematical laws, it may be they are exempt entirely from such laws. *Third*. It is to beg the question to assert that if mental phenomena cannot be regulated by mathematical laws, they cannot be the subjects of scientific estimates. No one has a right to assume that scientific knowledge must cease where mathematical relations cannot apply.

X. *Of the relation of space and time concepts to Motion.*

Can time and space relations, etc., be still further generalized?

§ 577. It has already been shown that the space and time relations of objects can be generalized as truly as their sensible or spiritual properties, and when so generalized can become *universals* of a very wide extension. The inquiry naturally suggests itself whether these relations can be still further generalized, and so be included under a concept of a still wider extension, as well as be subordinated under one another. In other words, can the *here-ness*, the *there-ness*, the *distance*, the *breadth*, the *height*, *depth*, and *solid content* of material objects, or their correlated mental images be set forth under a group of relations or attributes which are of still wider extent or application than themselves? Likewise, can the *now-ness*, the *then-ness*, the *past-ness*, the *futurity* and *duration* of an event be also generalized in a similar way?

Last of all, can *time* and *space* relations be brought together, and generalized by means of the relations common to the two, so that they can be coördinated in a logical classification, and can be defined by logical definitions? These inquiries have often been made and answered with more or less success by different philosophers. The fact that they have been made, indicates the interest that has been awakened in the subject, and illustrates the strength of the tendency which impels the mind to generalize and unite all the objects of its knowledge, even those which are so attenuated and abstract as space and time.

The universality of motion suggests space-relations.

One of the most general properties or attributes of material objects is their capacity for motion. Every material thing can be moved. The eye and the hand learn to separate the objects of perception from the great universe with which they are at first united, by the circumstance that they are moved and movable. The limiting surfaces, edges and corners of such objects are determined and traced out by the moving of the hand or the eye along or up to their several limits. Every act of motion brings with it the possible suggestion of some one of the relations of space. As an edge or surface cannot be perceived without involving to the percipient the relation of either to space, and as motion enables the mind to follow or apprehend the edge or surface, so does motion become the medium of bringing the relations of linear or superficial extension to imagination and thought. If the direction of the moving limit be changed, and the line or lines, the surface or surfaces are followed by the moving hand or the moving eye to the place of starting, then a superficies, or a solid portion of space, must be included to the touching hand, the following eye, the picturing imagination, and the generalizing thought. These motions, with their directions, can neither be *perceived* nor *imagined* without *suggesting* the corresponding relations to space of the objects which have moved, or which are bounded by moving objects.

We conclude, then, that there is not a single relation of space which cannot at once be brought before the mind, and, as it were, be created to the fancy by some act or process of motion. Motion is, therefore, equally extensive with all these relations. It attends them all. *It can suggest them all.* Each one of them can, therefore, in a certain sense, be expressed and defined in terms and concepts of motion.

Also the relations of position, and of rest.

Not only is this true of the relations of extension, but even those of position can be expressed by means of motion.

The meaning of here and there, above and below, behind and before, are all definable by acts of motion—to and from, this way and that way,—joined with counter or arresting motions, which stop their progress. When the question is asked of a child, What do you mean by these terms? it invariably replies by explanations of this kind. It says, in effect, Move an object in this or that direction, and then arrest it, and it will be *here* or *there*, *before* or *behind*, *above* or *below*.

Absolute relations of time.

The relations of time can also be generalized by means of motion. The motion of material objects suggests the relations of time as truly as it does the relations of space. A

moving body suggests duration as truly as it does extension, when the motion is complete; the act of starting suggests *then* as truly as it does *there*; the act of stopping suggests *now* as well as *here*. It may have come to do so by a secondary and transferred meaning, but it does so in fact and by a universal and inevitable connection.

Time-relations: how suggested by motion.

Even when time is thought or affirmed of mental acts and events, it is still represented by motion in space. Every such act is capable of being attended by some bodily movement. In point of fact, every mental act or state is so attended, whether it is observed or not. Hence, by a natural consequence,

when time is affirmed of processes (or states) that are purely spiritual, its relations are expressed in language and thought by motions that are corporeal. As the language and concepts of time, when applied to the spirit, are taken exclusively from space-relations, originally derived from material objects, so do such concepts come under the relations to motion which these involve. It follows that motion furnishes all the materials for a common generalization of both space and time objects, and that time and space relations by means of motion can be comprehended by a common classification in the same logical system.

Also mathematical quantities.

It also follows that mathematical *entities* or *quanta* are produced to the mind and defined by means of motion, the motion in such case being both imaged and generalized. This follows of necessity of what has already been explained of the relation of concrete objects and events to the several concepts

of magnitude and number. The truth of this proposition is still further confirmed by the language of mathematical definitions. These definitions always rest upon, and can be expressed by postulates. These postulates always suppose an act or acts of motion. In geometry we say, draw a line; terminate or bisect a line, giving a point; move a line and it gives a surface. In arithmetic and algebra we say *count*, that is, unite as wholes, or *add*, *subtract*, *multiply* and *divide*; all of which terms suggest or suppose some image taken from spatial motion as the result of the constant conjunction already adverted to, of the duration of the conscious spirit with its attendant measured space.

In what sense is motion the condition of generalization?

It ought however to be kept in mind, that motion is not the medium or instrument of generalization in precisely the same way as the other attributes or properties of matter and

spirit become so. Thus, we define the notion *egg*, by the various properties which constitute its logical essence, or, as we say, make up its definition. So, too, we define a material *act* which is complex, by resolv-

ing it into its simpler constituents, going back till we reach those which are ultimate and indecomposable. In a similar way we define spiritual beings and spiritual acts. In both cases we begin with the most generic concepts, and come down to those which are more specific. For the explanation of these properties or attributes, whether generic or specific, we must resort to experience, either of sense-perception or consciousness. This experience is presupposed in all definition. Simple ideas cannot be defined or analyzed. No definition can convey to the blind the meaning of color [generic] or of red color [specific].

Time and space attributes [more exactly time and space relations] are not given to experience precisely as are sensible and spiritual properties. They are involved in all experience, but they are not properly experienced. The space-relations of a concrete object are not apprehended by sense-perception in the narrowest sense of the term, but in connection with sense-perception. The same is true of time relations as apprehended by consciousness. When these objects are imaged, the same distinction is to be observed between what we directly experience, and what is given with experience, and, in a certain sense, is involved in experience. We can only image what we perceive. We cannot, as has been already said, § 566, image or picture space or time relations as such, but we can image those objects of sense and consciousness which involve space and time relations. Motion is not an object of sense-perception in the narrow meaning of the term, but it is its constant condition and accompaniment, i. e., it always involves some space-relations, and for this reason it can become the means by which these relations can be generalized and defined. For the explanation of the import of its terms and the concepts which they designate, we must refer to experience as we do in the case of sensible and spiritual qualities, i. e., we must assume and presuppose that every one knows what motion is in all its directions and varieties. With this medium at our command, we proceed to our constructions and definitions.

Two objections. To this view two objections may be urged. The first is, that space and time are as truly assumed and involved in the concept and definition of motion, as motion is required for the concepts and definitions of space and time. We define motion, it is said, as a change of place, and place is a relation of space. The objection is more plausible than real. First, that motion supposes Space and Time.

The terms *change* and *place* are indeed used in this attempted definition, but that does not prove that both are not definable by concepts of motion. What is place but some determinable or determined relation of space? But how is it determinable or determined except by means of motion? How is change of any sort, whether material or spiritual, made conceivable or general to the mind except by means of spatial motion? The question to be decided is, which furnishes the most general of elements or media for general concepts or definitions; which concept is the most generic, the concept of space or the concept of motion. It might be granted, perhaps, that the concepts and images of motion and space are equally original and therefore coördinate, and yet it would not follow that the concept of the one was not more generic than the concept of the other. The same may be said of the intuition and concept of time as compared with those of motion.

Again: it is obvious that we may have an intuition of motion as of sense-percepts *per se*, without adverting distinctly to the relations of either to space. We may see a colored line or follow a moving body in a linear path, without distinguishing by analysis the length of either as involving the space to which the length or superficies is related. This being so, the motion might be more suitable as a medium of generalizing our concepts of space relations than the space and its relations which it is desirable to conceive and define by means of motion. That to which the mind first and most readily attends; that which it most familiarly recalls; that which it most easily recognises, would be better fitted for such a purpose than that which is less obvious and less familiar, even though both were equally general.

It is urged again, that the rate of motion is always estimated by means of time: the swiftness or slowness of motion from one point of space to another is computed by the longer or shorter time which is required to move from the one to the other. This is true, but so again is it true that duration itself, as longer or shorter, is described and conceived by the length of space passed over by a body supposed to be moving steadily; and that two or more equal portions of duration are measured and set forth by the same or equal

It is urged that the rates of motion are estimated by time.

portions of space passed over by a moving body. Motion involves time and space, else it could not generalise or define either. Both time and space are presupposed as the conditions of motion. Real time and real space are assumed in order that the *concepts* of motion should be possible, but it does not follow that that which is selected as the means by which both are generalised *into concepts* is not that motion which is so intimately connected with each as to suggest both whenever it is perceived or imaged.

The second objection would be that not motion only, but motion and *direction* are required for the generalization of space and time objects, and especially for the construction and definition of mathematical *quantia*. A line cannot be drawn or conceived as straight or curved, without introducing the element of direction to a fixed point or of variation from it. One or more continuous surfaces cannot be made to include a content of space without a change in direction which is observed and recognized as an element in its product or construction. Let this be granted, and still it does not follow that the concept of motion is not the most generic. Direction supposes motion; direction is specific and is itself a means of making specific the more generic concept of motion. Motion cannot occur or be conceived of without taking some direction, any more than without implying space and time as its real conditions. This rather proves than otherwise that motion is itself the most generic or the ultimate concept of all. Cf. A. Trendelenburg, *Logische Untersuchungen*, Berlin, 1840. 2te Aufl., Leipzig, 1862.

Second objection, that direction is required as well as motion.

§ 578. The extended and enduring objects which we have thus far considered, are *limited* objects, and the relations to space and time which they involve belong to these objects as limited. Whether these objects with their relations are presented by sense-perception or consciousness, are represented to the imagination or generalized in thought, they are necessarily definite and limited. The so-called dimensions of extension—length, breadth, and thickness,—and the various relations of duration, can only be affirmed of finite beings and activities. These beings must occupy portions of space. Every length, every breadth and thickness perceived, is definite in its dimensions. So is it with every one of either that is represented. So is it with every one that is generalized; even the general conceptions of either contemplate and suppose only some definite dimensions of each. The generic word extension supposes extension as applied to limited and measurable objects, and therefore always signifies limited extension. The same is true of duration and its attributes or relations. Even mathematical relations can only be conceived of as limited or definite quantities. These, as we have seen, presuppose some objects imagined to exist in space, or series of such objects connected by acts continuous in time, of which certain attributes and relations are affirmed, *i. e.*, they invariably presuppose limited objects.

Mathematics recognizes measurable, and therefore definite quantity. Mathematical science has to do only with mensurable and of course with definite quantity. The infinite and indefinite have properly no place in mathematics. What is called the mathematical infinite is either a quantity as yet not measured or numbered, or quantities in respect to which these processes have been begun but are not yet completed; or a quantity so nearly commensurable that the one may be substituted for the other. The so-called infinite quantities of the mathematics are quantities not yet actually or proximately defined, *i. e.*, mensurable but not yet measured or defined. They should be carefully distinguished from what, in distinction from them, may be called the actual infinite or unconditioned. Not that the two are wholly unrelated, or independent of one another, but that they are by no means the same. The conception of the mathematical infinite or indefinite may be rendered possible by the real infinitude of time and space, but as concepts the two are wholly diverse, if indeed we can be said to have any concept at all of the latter.

XI. *Of Space and Time as infinite and unconditioned.*

Extension and duration distinguished from, but related to space and time.

§ 579. The several attributes of extension and duration are not only attributes of limited objects and therefore mensurable and definable, but they involve relationship to another sort of objects, and a knowledge of the existence of these objects. These objects are *space and time*. The attributes of extension and duration, though predicable of matter and spirit and their phenomena, are unlike the qualities of matter and spirit in that they have no positive import given in the experience of sense and consciousness, but in their nature carry the mind to other objects to which they hold relations. The definite length or breadth, the superficial or solid content of a material box or ball are not only affirmable of the matter of which the box or ball consists, but imply a relation to, and are attributable of, the object or objects adjacent; whether these are material, one or many, as the air which surrounds them, or which if hollow they are conceived to include; or whether these are void of all matter whatever. The adjacent object or objects are in their turn limited objects, and besides, their material qualities hold similar relations to other objects, whether these possess or are void of material qualities. The duration of one or more acts or events is not merely affirmable of one or more of the acts or events, but it involves possible relations to other acts and events—coexistent, preceding and following—and also to the Time to which all are related and whose existence they all imply.

Nothing is more clear to human cognition than that the so-called material and spiritual properties are distinguishable from their attributes of extension and duration. The peculiarity of the last consists in their being in their very nature *space and time relations*. That is, while they are predicable, and therefore properties of things and events, they imply and reveal relations to those entities or objects which are called time and space.

These attributes and properties, when considered collectively are or may be called extension and duration. The appropriate names of the entities to which these properties involve relations, are time and space. Thus distinguished, extension and duration, i. e., extension and duration in the concrete or the extension and duration of individual objects, are known by experience, while space and time, as soon as they are apprehended at all, are known to be *a priori*, i. e., the necessary and fundamental conditions of all actual existences and events as extended and enduring.

These relations not always distinctly adverted to.

It is not asserted that in applying these attributes to objects of experience the mind necessarily adverts to the relations to time and space which they imply, but only that when the mind gives attention to them, it cannot fail to discover that these relations are implied, and with them the existence of time and space. To make this discovery the mind may need to make the experience of many objects of sense and consciousness. It may need the discipline of many acts of attention to separate and analyze what is at first known confusedly and without discrimination.

In order fully to appreciate the time and space relations of objects and events to one another as well as to time and space themselves, the imagination may need to be called into exercise. One material object may need to be annexed to another and still others to all these, before space can be fully understood in all the relations which it involves to the extended objects thus believed or supposed to exist, or to other extended objects besides. In like manner, many events must be experienced, in order that the common relations of all these, and of all conceivable enduring objects, to time, may be distinctly apprehended and clearly distinguished from the time which is common to them all. The psychological conditions of knowledge are clearly distinguishable from the nature and the evidence of the objects that are known. The one describes the subjective conditions that render it possible for an individual to employ and apply his mind in such a manner as to discern a fact or truth. The other describes objectively, what in its nature is knowable by all individuals under these subjective conditions, and the evidence, if there be any, by which it is known.

Discerned at the last of the stages of Intellectual development.

We have already indicated the several stages or degrees of progress through which the mind may proceed in mastering the full import of, and in reaching distinct assent to, the remoter objects and relations that are gained by Intuition. We have clearly distinguished between the clearness and certainty

of that which is knowable and the possibility that it should be clearly and certainly known by this or that individual or even by this or that class of men.

These attributes, known collectively as extension and duration, are not on the one hand properly qualities of material or spiritual beings and their acts, nor, on the other, are they the supersensible entities themselves, called Space and Time, but they are the relations of the objects and phenomena of sense and consciousness to these supersensible entities. Being relations they imply the reality of the objects related, and they cannot be understood or known except by means of these objects.

They limit objects and events.

§ 580. Extension and duration are also the *limits* or the grounds of the limits of objects and events. Not only are they relations of objects to supersensible entities, but they enable the

mind to distinguish objects from one another as diverse in place, as *near*, *remote*, *here*, and *there*; as in this or that direction; as *now*, *then*, *past*, *present* and *future*. These pertain not to space and time, but to objects and events as related to *Space* and *Time*, and therefore and by this means to one another as also related to space and time.

Strictly speaking, when these relations are used as limits, they are relations not between the concrete object and time or space, but to two objects as existing in space or in time, or as conceived thus to exist. When, for example, I perceive a box either inclosing or inclosed by what we call a void, and affirm that which is without, is not that which is within, or conversely; both that which is without and within are conceived as matter with surfaces mutually coinciding, but yet dividing or limiting the one from the other. If I conceive of the outmost limit of the universe of matter and ask what is beyond, immediately as I ask the question I attach the limiting surface to other matter which is conceived to be beyond, and the outlines of which I begin to trace by the constructive motion of which the imagination is capable. Of this outline, one portion, viz., the limiting surface already described, is fixed. The others are not yet drawn; the mind has no occasion even to conceive them drawn, and it rests in the knowledge or belief that it might complete them in any way in which it chooses. But as soon as they should be completed they must necessarily be conceived as inclosed by or inclosed with matter, for the simple reason that an extended surface of that which has no actual being can not be conceived or thought of.

In a similar way the instant which terminates or limits an event, is the beginning of an-

other as yet inchoate or incomplete. So the beginning of an event already past is the end of the event that was transacted before it.

What we call Space and Time are those entities which can be occupied, as we say, by beings and events, i. e., which render their actual existence possible, and which in rendering them possible, also make it possible that they should be limited from one another, or distinguished from one another by their common relations to space and time.

Extension and duration affirmed of things and events only.

§ 581. *Extension* and *duration* cannot be affirmed of *Space* and *Time per se*, but of existing material objects and actually occurring events as mutually related to and limited by one another by reason of their common relation to space and time. We cannot conceive of parts of space or time as diverse from one another, or as mutually related, as *here* and *there*, *before* and *after*, without the aid of beings and events. Even those which are conceived to be bounded by surfaces and lines, as geometrical quantities and the so-called portions of duration, which may be divided by instants, are only conceivable as occupiable by bodies and events. The matter of either may be imagined as so refined in its nature as to admit of great refinement in these limits or relations, but without the matter conceived as real or possible the limits and relations are inconceivable.

Relations of place do not belong to space, but to bodies perceived or imagined to exist in or by space. Relations of time do not belong to duration, but to events occurring in, or by, i. e., presupposing time.

In what sense Space and Time are unlimited.

§ 582. It follows that Space and Time are *not limited*, simply because the conception of *limits* is *inapplicable* to them. It is by its very nature only applicable to and affirmable of extended matter and occurring events. When we attempt to apply it to Space and Time we can only do it by means of objects and events. When we seem to ourselves to have been successful, we find that we have really though perhaps unconsciously made use of such objects and events. The conception of limit or limitation is inapplicable to either Space or Time. It is in this sense that we affirm that Space and Time are unlimited. This attribute is purely and simply negative. It denies that the relation of limitation which pertains to bodies and acts can pertain to Space and Time.

They are not simply negatively related.

It does not, however, follow, because Space and Time are not limited, and that they in this way are negatively distinguished, that they are capable of no positive attributes. We direct the attention for the present to the negative character of these relations, in order that we may preserve ourselves from many of the alleged incompatibilities which are conceived to be involved in the attempt to know or conceive Space and Time. Cf. § 690.

Antinomies of Hamilton and Kant.

Thus Hamilton (*Met.* 38) urges that we are under the necessity of conceiving space and time either as an absolute maximum or an absolute minimum, and that it is impossible to do either, because the mind, as soon as it has fixed the limits to the ultimately great or the ultimately small, will immediately overstep or go beyond the limits which it had just established, and will find itself continually baffled in its impotent efforts to grasp we conceive either.

In the same strain, Kant urges that the mind, in its attempts to conceive of space and time, is con-

tinually setting up two incompatible propositions—which he calls *Antinomies*—both of which cannot be true, and yet one of which would seem to be necessary. Both overlook that the *maximum* and *minimum* which we attempt to conceive are not *space* and *time*, but *bodies* and *events* as limited in *space* and *time*. The *maximum* and *minimum* in the case are not *space* and *time*, nor are they concepts of either, but they are concepts of *bodies* and *events* as related to and limited by *space* and *time*. They are limited concepts, and in their very nature logically inapplicable to objects which cannot be limited. To attempt to think of *time* and *space* under any such concepts, however great or small, is to make an effort which will involve certain and constant contradiction and inconsistency. To attempt to picture *time* and *space* to the Imagination is impossible, for we can only picture objects and events, with definite properties and characteristics. Even when we lay aside all properties except what we call their *time* and *space* relations, what we picture or imagine are still limited objects in *space* and *time*—objects with some defined limits of extension and duration, but not *space* and *time* themselves. It is true that every time we picture or image such objects we must think of their relations to their correlates, *time* and *space*; but *time* and *space*, in themselves, can neither be imaged nor pictured.

§ 583. Again, *Space* and *Time* cannot be *generalized* or *apprehended* by or under concepts. Concepts suppose definite attributes of objects limited by and individualized in *Time* and *Space*. These attributes to be generalized must be similar in the individuals to which they belong, and these similar and oft-repeated individualized attributes must be gathered under generalized concepts. But *Time* and *Space* are withdrawn from these conditions of generalization, for they are necessarily supposed as the conditions and correlates of all individual existences and of their attributes. Even the relations of extension and duration, by which individual objects are possible, cannot be intelligible except by means of these entities which are the necessary correlates to these universal properties of all individual existences. The properties are generalizable, but the entities themselves to which they are related cannot be generalized. Nor are they individual objects, if by that is intended objects which possess generalizable properties which can be gathered into concepts.

§ 584. *Space* and *Time* cannot in the ordinary sense of the term be *defined*. If we cannot form concepts of these entities by means of generalized attributes or relations, it is manifest that we cannot define these concepts, because to define is simply to state the attributes into which a concept thus formed can be resolved, § 391. They are not simple concepts, for simple concepts pertain to single indecomposable attributes or relations, § 390, and no one will for an instant believe or contend that the import of either is exhausted by any single property or relation.

What is demonstrated to be necessary from the nature of the case, is confirmed by fact and experiment when we submit to trial. Whenever we endeavor to define these entities we find ourselves employing concepts which presuppose that they are already known. Every concept that we use is an attribute or relation of some object or event which exists in *space* or *time*, and which implies some relation of either to one or both. We fall, therefore, continually into the circle of using in our definitions terms that presuppose that to be known which we attempt to define or describe.

Not only is this shown to be necessary from reasons that are purely logical, but the nature of language confirms this view. Even if we should concede that attributes might be found which do not imply *space* and *time*, such

Space and Time cannot be generalized under higher concepts.

They cannot properly be defined.

Proved by language.

attributes could not be expressed in language without supposing their existence. The exigencies of communication require that every thought attribute and relation, in order to be expressed, should be imaged by some picture borrowed from Space and Time. Even then, if Space and Time did not intrude in the attributes by which we seem to define them, they must necessarily present themselves as images in every such effort, and they could not be repressed.

When Hamilton says that these entities cannot be conceived, he doubtless has in mind what we here assert, that they cannot be analysed into attributes or defined by such attributes as presuppose and imply their existence. Whether this is a correct use of the term *to conceive*, may be a matter of question, and also whether the further assertion which he makes is true, that we can know by faith or believe what we cannot in any sense conceive.

§ 585. Space and time are known by *intuition* as the *necessary conditions* of the existence and the conception of all objects and events. Every object and event, as has already been explained, has properties or attributes which imply the existence of these entities. In *knowing* that these objects exist, we know that time and space exist as their *actual* conditions. In *conceiving* of these objects or events as real or possible, we must conceive of them as related to space and time, and, of course, must recognize time and space as the *logical* conditions of their concepts.

While, then, it is true that we can neither generalize nor define time and space, because the very attributes which we must employ imply both, it is true, on the other hand, that we cannot generalize or define any object whatever without recognizing both, and, therefore, time and space must enter as the material into all our concepts. Again :

Though time and space cannot be defined or conceived by the relations of objects and events which imply time and space, yet, on the other hand, as the *correlates* of all such objects, they can be explained to the mind by means of the limited relations which imply their real existence. It is so far from being true that, because space and time are known by intuition, they are known out of all or any relation to limited objects and events; that it is only possible to know them in such relations, or connections. They are only known as implied in and required by the relations which are called collectively the extension and duration of such concrete realities. And yet, as has been shown, they cannot be generalized nor defined by means of any attributes or relations whatever, because all such imply their existence. They can not, on the other hand, be suggested or recognized in either thought or language, except by means of these very relations which connect them with finite objects.

It has already been asserted, § 517. (5) that the distinct recognition of these correlates, in, as it were, the *8th* or last stage of the mind's attainment in cognition, which is reached by the few who are trained to habits of speculative analysis and discrimination. If this is so, then it is obvious that the number of thinkers is very small who have any occasion to ask the question, whether space and time can be defined, or whether they are known out of relation to, or by means of their relations to the concrete. But the persons who have occasion to ask

these questions can certainly comprehend that the very relations which cannot possibly define time and space, because they imply them, may, for this very reason, be the only medium of bringing them before the mind for the uses of thought.

What, then, are space and time? Are they substances, qualities or relations? Or are they the forms or subjective conditions of knowledge by sense or consciousness? or is it impossible to ascertain what they are? These questions will force themselves upon the attention of a few; and require an answer.

Are they substances? That they are material things with sensible qualities will scarcely be imagined or contended by any one. No one would honestly believe or seriously urge that they can be heard, or smelled, or seen, or tasted, or touched. All substances called material are apprehended by some of the senses, and hence are regarded as having sensible qualities. Space and time are not perceived in such a way or by such means, and hence cannot be classed with material substances. The earliest philosophers might, perhaps, have regarded them as such in their imperfect analyses or crude theorizing, but no sane thinker would now advance such a dogma. Nor are they spiritual beings. They have none of the properties of spirits. They cannot think, or feel, or will. Nor can they be apprehended by consciousness in the special and limited sense of the term. In a general sense we say we are conscious of our spiritual acts as enduring, § 554. But this is no more than to say we are conscious of the necessary relations of these acts to time. We never say we are conscious of any activity of time, which is analogous to the activities of a spiritual being. Neither time nor space is a spiritual substance.

They are not qualities or properties of spirit or matter. Dr. Samuel Clarke maintained that space and time are attributes or modes, and that inasmuch as they were both infinite, there must be an Infinite Being to which they belong. James Mill, in his *Analysis of the Human Mind*, asserts that they are simply abstract terms which stand for collective conceptions of those attributes of extension and duration, which belong to individual beings and acts. But it needs no further discussion to prove that they are and can be neither. Nor are they simply relations, as Leibnitz maintained. This philosopher defined 'space as an order of coexistences,' and 'time as an order of successions.' "Pour moi, j'ai marqué plus qu'une fois, * * que je tenais l'espace pour quelque chose de purement relatif, comme le tems; pour un ordre des coexistences comme le tems est un ordre de successions."—*Third letter to Dr. S. Clarke*, § 4, ed. Erd. p. 752. Using extension as its equivalent, he defines space as the order of possible coexistences; and time as the order of inconstant possibilities. *Reply to Bayle*, ed. Erd. p. 189. *Calderwood* defines time as "a certain correlation of existences," and distinguishes his own view from

What are space and time?

They are not substances.

Nor are they material or spiritual properties. They are not relations.

that of Hamilton, who calls it "the image or concept of a certain correlation of existences." *The Phil. of the Infinite*, 2d ed., 1861, chap. v.

It is evident from what has been said already, that space and time are neither *relations* nor *correlations*, but *correlates* to beings and events. Extension and duration are the relations or correlations in question; but these involve space and time as *realities*.

Nor are they subjective forms of the intellect. Again: Space and time are not *forms of intuition* [i.e., presentation] in the sense suggested by Kant. This philosopher taught that if we distinguish the matter apprehended by perception and consciousness from the forms of this matter, then space is the form of sense-perception or external intuition, and time is the form of consciousness. There is a sense in which this doctrine is true. Extension is the form of all material objects in the sense that all such objects are perceived as extended, and none can be apprehended except under the form or condition of being extended objects. When all the matter which is given in the various sensible qualities is thought away, the relations of extension remain. This matter is various, Each object has qualities of its own, and variously combined, by which it is distinguished from every other; but all objects are extended. The same is true of the matter furnished in consciousness as distinguished from its relations of duration.

Kant's doctrine open to two objections. But the doctrine as further expounded by Kant is open to two exceptions. *First:* He fails to distinguish between extension and duration as relations and the correlates space and time which they involve. He does not notice that these very relations, after or under which all objects and their concepts are and must be formed, do in their very nature involve the intuitive knowledge of space and time as realities, and that to suppose that they are only forms is to exclude and eliminate that which is given and affirmed by their very nature. *Second:* The suggestion or the assumption that they depend on the subjective constitution of the human intellect is unwarranted by positive evidence and is contradicted by the testimony of the intellect itself. The supposition that intellects of another order might possibly exist, which could know objects without the relations of space and time, is without proof and against proof (§ 533). In other words, that which makes it possible and necessary for extension and duration to be the forms of perception and consciousness is the fact that the objects of these two modes of knowledge are in reality related to the entities space and time.

How space and time are knowable.

But what are these entities? Shall we say of them, as St. Augustine is reported to have said — "What is time? If not asked, I know, but attempting to explain, I know not?"

This, in one view, is correct. We know by intuition that time and space exist, and are related to every object, but to explain or define what they are, is not so easy. It may relieve our embarrassment in part to explain why we cannot answer the question in one sense, and why we can in another. If, in answering the question *what*, it is expected or required that we should class them with objects limited by space or time, or objects having material or spiritual properties, or objects holding relations to space or time, in other words, that we should class them with beings, qualities, or relations in the ordinary acceptance of these terms, then it is obvious that we cannot answer this question at all. We cannot say *what* they are. But we know *that* they exist, i.e., there exist realities which answer to the names. Their existence is implied in the existence of every limited object and property, because every such object and property is related to them. We cannot believe or know that the one exists without knowing that the other exists also. But can we in any sense of the word *what* explain what it is which we know exists? We can, so far as to say that they are entities to which all these limited objects are related, and which are, therefore, correlates to them. If they are correlates to all limited objects they are known and described by their relations to them. By their very nature they are entities to which these objects bear these relations, and by their relations to these objects they are known and thought of. They cannot

be said to be defined in the sense in which limited objects are defined, but they can be brought to mind by language as the necessary correlates of limited existences by means of their relations to them.

These relations to both space and time are represented in thought and language by means of *motion*, as has already been explained, and hence it follows that space and time are set forth in thought and language by the same medium.

We conclude, therefore, that though space and time cannot be conceived or defined in the sense in which those objects can be conceived and defined which bear relations to them, yet, on the other hand, they can be thought by means of their relations to these objects. Limited objects must be related to their unlimited correlates. These correlates can be known and described by means of the relations which they in their turn hold to these objects. In whatever sense they may be said to be unconditioned, infinite, and absolute, they are not so in any such sense as to exclude the possibility of being related to the limited finite. By means of these relations they can be both conceived and known.

CHAPTER V.

CAUSATION AND THE RELATION OF CAUSALITY.

FROM the formal and mathematical intuitions we come to those which are *real*, i. e., which are required to explain the attributes which are respectively distinctive of material and spiritual *beings*: which unite these attributes into those concepts and classes which designate the real existences and agencies of nature, as well as connect these with one another in those relations which are necessary for the systematic and rational explanation of the universe. Into these real relations all the actually existing properties and powers of matter and spirit are resolved. Under the laws which regulate their operation, the effects and purposes that describe the universe are accomplished. We shall consider first, the *relation of causality or causation*. This is preëminently the relation which is required in *analysis*, as by means of this, *beings* are resolved into those elements of which *concepts* are composed, which are more or less nearly their *ultimate* elementary constituents and are more or less widely *generic* or *extensive*, according as thought and science are more or less successful in their achievements.

§ 586. The relation of causality is sometimes called *the Principle*, at other times *the Law* of causality, causation, or cause and effect. The first of these appellations is *subjective* and *logical*, and designates the place which the relation or the proposition in which it is expressed holds in the systematic arrangement of our knowledge, of § 514. The other is *objective* and *real*, and indicates its universal prevalence among objects actually existing. *Causation as a principle* is placed first or highest with reference to the other concepts or truths which depend

Causation as a principle, and as a law.

apon or are derived from it—either relatively or absolutely, according as the truth is received as original or derived. Causation as a *law* is viewed as a relation actually prevailing in or ruling over the finite universe of physical and spiritual being.

How the two are stated. Causation as a *law* may be stated thus: Every finite event is a caused event, or, more briefly, is an effect. Causation, as a *principle*, may be thus expressed: Every finite event may be accounted for by referring it to a cause as the ground or reason of its existence.

Tautology to be avoided. It is scarcely necessary to observe, that the proposition, every effect must have a cause, is purely and simply identical. It is mere tautology, expanding in the predicate what had been implied in the subject. The term effect, in its import, implies a cause by a logical necessity. To say an effect must be caused, is as reasonable as to say, a caused event is caused, or, $xy = x \times y$.

That the fact or law of causation is assumed to explain and justify reasoning of every sort, both Deductive and Inductive, has already been shown. A reference to § 515, will serve to explain and enforce the relation of causation as a law, to causation as a principle, as well as to illustrate the sameness and difference between a real and a logical relation.

Power and law, how distinguished. Many Physicists insist that a distinction should be invariably made between the *laws of nature* and the *powers, forces or causal agencies of nature*, and that law should be invariably restricted to the conditions or regulating methods of the acting or working of these powers and forces, a formal statement or formula of which is that alone which deserves to be called a law. Tried by this dictum, the phrase, *the Law of Causality*, would not be accepted. That it is not improper is manifest, from the consideration that it describes and assumes the fact, that the causative relation is universally applicable to every event or begun existence. So conceived, the fact may properly be called a *Law or Universal Method of nature*.

What is an event? § 587. Causation, both as law and principle, is affirmed of events. But what is an *event*? An *event* is something which is known to be, which was not; or which begins to be or to occur. Events are, therefore, finite, i. e., limited by relations of space or time. Their existence or occurrence implies change. Something is here and now which was not. Of these changes it is affirmed that they were caused.

Events in the material world. In the *material world*, events are changes of place or relative position, motions in space, changes of form, changes of properties in respect to existence or intensity. If an iron ball is found in a new resting-place; if we see it hurled through the air; if it is beaten into a cubical form; if it is rolled into a mass, or drawn into wire; if, under the strokes of the hammer, it is heated, or magnetized, or made brittle, these are all events, i. e., new occurrences in the sense of our proposition. They are often called phenomena, i. e., manifestations to the senses or the consciousness of some causal power or agency.

In the vegetable and animal world. Events or phenomena are more numerous and conspicuous in the *vegetable and animal world*. There is growth, change of form and of structure, the manifestation of new colors, odors, etc. Above all, there is constant motion, as in the plant that waves its stem and top as if impatient that it is fastened by the roots to the earth; and in the animal, that moves from place to place, and with its limbs, voice and features, is ever making some new manifestation that asks to be explained.

In the mental world. In the *mental* or *spiritual* sphere, there is ceaseless activity and endless production. New thoughts, new feelings, new purposes flit before the observant eye of consciousness faster than they can be accounted for. With the progress of time, the mind is aware of an increase of its power to remember, to imagine, to reason, to feel, and to resolve. All these are events or phenomena.

In the production of new beings. But besides phenomena of these classes, in acts, states, or qualities, more or less lasting; there are still others in the existence and production of new and separate beings which deserve preëminently to be called events, of each of which a cause or causes are affirmed.

Such are the division or disintegration of masses of matter by mechanical crushing or pressure, and the production of new compounds by chemical union or their decomposition into simpler elements, as the generation of a gas or the deoxydation of a metal. In vegetable and animal life, we have the seed or the egg, in each of which are the beginnings of a new living being, which, after passing through the required processes, becomes completely independent of its originator, and assumes the size, the strength, and developed properties of a separate existence. Spiritual beings also begin to exist. They emerge to view by acts which show their presence and their power. They are sources of knowledge, power, wealth, comfort, and hope to other beings.

Besides these, there are conditions or states more or less permanent which require to be accounted for, such as the equilibria of forces or pressures, as illustrated in the action of gravitation or electricity, of fluids, currents, and other tendencies. All these, so far as the law of causation is concerned, come under the class of events or phenomena.

Many events are combined of several. § 588. Many of these so-called events and phenomena are a *combination of several*. They are complexes made up of many units. But the single or simple units are none the less truly events than the wholes of which they are constituents. Whether the event in question is known to be simple, or whether it is not, and yet is supposed to be simple, the rule holds good of it, that, whether simple or complex, it must be caused. Hence it makes no difference so far as the application of our principle is concerned, whether the event or phenomenon has or has not been subjected to a finished analysis, *i. e.*, whether it has or has not been resolved into its ultimate elements. If the question be raised, What is an event that cannot be further resolved, what is a single, or the simplest phenomenon? we have only to reply, that any change the least extensive in space, or the briefest possible in time, which can be discerned by human observation, is a single event. It is the last product or result of the most refined analysis of which human knowledge is capable, when assisted by every appliance of discipline and culture and art.

Every cause is an acting being. When we say, every event is caused or has a cause, we distinguish between beings, their acts, and their products. Every cause is an acting being and an agent acting to some result. The result is the effect. Any thing whatever, so far as it is a cause, is a being, and not a phenomenon. It may be itself an effect or product of the action or causal efficiency of another being or beings, but that which is produced is capable of action of its own. A mere phenomenon or event as such, is not regarded as a cause, but only as an effect. What is the difference between an acting being

and its capacities, or acts, or attributes, will be considered in its place. It is enough that at present we notice that the distinction is real.

Causes distinguished from conditions.

§ 589. Again: We distinguish between the cause of an event and the conditions of its actually producing the effect. The stroke of a hammer is the cause of the fracture of a stone, of the flattening of a leaden bullet, of the heating of a bit of iron. The conditions of the effect would, in such a case, be said to be the properties of the stone, the bullet, or the iron. If the breaking, the flattening, or the heating of the mass are the several effects of the common cause, the varying effects are ascribed to the varying conditions under which, or the objects upon which it acts.

In this case the effect is more properly said to be the resultant of the joint action of the striking hammer and the resisting stone, lead, and iron. This doctrine is thus generalized by Mill: "The real cause is the whole of these antecedents (or conditions), and we have, philosophically speaking, no right to give the name of cause to one of them exclusively of the others." *Log.*, B. iii. c. v. § 3. To the same effect, says Hamilton: "Every effect is only produced by the concurrence of at least two causes (and by cause, be it observed, I mean every thing without which the effect could not be realized)." *Met. Lec.* 3. In common life a distinction is made between the efficient and patient cause, the last being put for the object, i. e., that in which the causal agency is manifested, or upon which it is exerted. It is obvious that that whose activity is most obvious or demonstrative, is called the efficient. The patient or recipient often manifests no force at all, as the cohesion of the stone, lead, or iron in the cases supposed.

When conditions are laws.

Sometimes the objects in their matter and chief elements are said to be the same, but the force or causal agency is applied under diverse conditions of quantity, time, or distance, as a chemical agent is doubled; the gravitating force operates at a varying distance; a wave of light acts with twice a given rapidity. These last are called in scientific language, the laws of the acting of forces or powers (causal agents) of nature.

The principle of causality intuitively evident.

§ 590. With these explanations of the import of the terms of our proposition, we assert that the mind intuitively believes that every event is caused, i. e., every event is produced by the action of some agent or agents, which, with respect to the effect, are called its cause or its causes.

The reasons for this view are the following:

Ground of explaining events.

(a) All that we do in common or practical life, rests upon and is directed by the assumption of this truth. Our explanations of events that have occurred would have no meaning without it. They consist in referring these phenomena to the beings or the agencies which have occasioned them. When these producing agents are discovered, and the modes and laws of their action are referred to or unfolded for the first time, the process of explanation is complete.

Ground of seeking to account for an event unexplained.

(b) When an event has occurred which is not yet accounted for, the mind is aroused to the effort to solve or explain its occurrence; it believes just as firmly that it can be accounted

for in the way described, as if the explanation had been in fact attained. It is as confident that its occurrence depends upon some cause or causes, before, as after the cause has been determined. Upon this confidence rest all the inquiries and experiments which it sets on foot.

(c) Not only does the mind explain the past, but it relies upon the future, on the ground of its faith in causation. It provides for or secures future results by availing itself of the causes which it knows will produce them. It employs these agents in all its plans and experiments with entire certainty concerning the results which they will effect. It predicts these results with confidence so soon as it is certain of all the causes which are or may be put into action.

Ground of curiosity.

(d) In these explanations and experiments the mind is impelled by a special emotion, called curiosity. Curiosity is more than an interest and desire to know an event as a fact; it impels to the knowledge of its causes and laws, of its origin and growth. The existence of a strong and apparently original emotional capacity of this sort confirms the view that the relation itself is original as a law of existence, and that the belief in it is a fundamental principle of the mind's knowledge.

Relation to thought and scientific processes.

What the mind unconsciously assumes to be true in practical life, it distinctly and consciously applies in all the methods and processes of thought and of science. We have seen that deductive reasoning has no meaning except the relation of causality is assumed, and that induction in its researches after the forces and laws of matter and of spirit, makes the same assumption. Science, in all its processes, investigates the properties, the powers, the forces, the attributes, and the laws of all existing objects. But properties, powers, forces, and attributes are all of them terms which directly assert or indirectly imply that there is a causal energy or activity in these objects. The laws of matter and of spirit have no import, and can admit no application except as causal agencies are affirmed which these laws measure or formulate. Except as the causal relation is believed or assumed, scientific knowledge can have no import, and scientific inquiries would be meaningless and impossible.

Confirmed by language.

Moreover: the relation of causality is wrought into and expressed by the structure of language. There are, in every language, classes of single words, and combinations of words, which decisively prove that this relation is held to be real by all men. There are words which express causal activity, words which express the reception of such activity, and words which express the change which is wrought in an object by means of causal activity. The grammar of every language furnishes proof of this, both in its etymology and its syntax.

Meets all the criteria of a first principle.

These considerations prove decisively, that causality, as a relation or principle, meets all the criteria of *universality*, *necessity*, and *certainly*. If it cannot be resolved into some other relation equally general, or more general than itself, we must conclude that it is original, and intuitively discerned and believed.

Resolved by many into a time-relation.

§ 591. The history of speculation abounds in attempts to explain the relation of causality by some relation of time. This is not surprising. The relations of time pertain to all

objects whatever. If objects are connected by the relation of causality, the same objects must be united to observation, either as co-existent or as successive. The most conspicuous advocates of this disposition or solution of the causal relation, are *David Hume*, *Dr. Thomas Brown*, and *John Stuart Mill*.

In connection with the views of each concerning the *nature* of the causal relation, it will be convenient to give their views of *the way* in which the mind is led to *accept* the principle of causality.

The theory of *Hume* deserves consideration for the clear statements and lucid style in which it is presented, for the ability with which it is defended as well as for its great importance in the history of modern speculation. It

is well known that it was *Hume's theory of causation* which roused to more profound researches the antagonist philosophies of both *Reid* and *Kant*.

What his theory was may be learned from his own language.

"The first time a man saw the communication of motion by impulse, as by the shock of two billiard-balls, he could not pronounce that the one event was *connected*, but only that it was *conjoined* with the other. After he has observed several instances of this nature, he then pronounces them to be *connected*. What alteration has happened to give rise to this new idea of *connection*? Nothing but that he now *feels* these events to be *connected* in his imagination, and can readily foretell the existence of one from the appearance of the other. When we say, therefore, that one object is connected with another, we mean only that they have acquired a connexion in our thought, and gave rise to this inference, by which they become proofs of each other's existence; a conclusion which is somewhat extraordinary, but which seems founded on sufficient evidence." * * "We may define a cause to be an object followed by another, and where all the objects, similar to the first, are followed by objects similar to the second. Or, in other words, where if the first object had not been, the second never had existed. The appearance of a cause always conveys the mind, by a customary transition, to the idea of the effect. Of this we have experience. We may therefore, suitably to this experience, form another definition of cause, and call it, an object followed by another and whose appearance always conveys the thought to that other."—*An Inquiry concerning the Human Understanding*, Sec. vii. p. ii.

"Necessity is something that exists in the mind, not in objects; nor is it possible for us ever to form the most distant idea of it considered as a quality in bodies. Either we have no idea of necessity, or necessity is nothing but that determination of the thought to pass from causes to effects, and from effects to causes, according to their experienced union. Thus the necessity, which makes two times two equal to four, or three angles of a triangle equal to two right ones, lies only in the act of the understanding, by which we consider and compare these ideas; in like manner the necessity of power which unites causes and effects, lies in the determination of the mind to pass from the one to the other." * * "There may be two definitions given of this relation, which are only different by their presenting a different view of the same object, and making us consider it either as a *philosophical* or as a *natural* relation; either as a comparison of two ideas or as an association betwixt them. We may define a cause to be 'an object precedent and contiguous to another, and where all the objects resembling the former are placed in like relations of precedency and contiguity to those objects that resemble the latter.' If this definition be esteemed defective, because drawn from objects foreign to the case, we may substitute this other definition in its place, viz. 'a cause is an object precedent and contiguous to another, and so united with it that the idea of the one determines the mind to form the idea of the other, and the impression of the one to form a more lively idea of the other.'"—*A Treatise of Human Nature*, B. I. sec. xiv.

The Theory of
Hume as briefly
summed up.

The Theory contained in these statements and definitions is briefly this: a cause is a constantly precedent, and an effect a constantly subsequent event. They are discovered to be such by the constant conjunction of the two. The necessity by which objects conjoined, are connected as cause and effect, arises from their being united in the mind's own experience, and the circumstance that the thought or observation of the one determines the mind to a lively idea of the other.

Does not profess
to be universal
in its applica-
tion.

A little reflection reveals the fact that Hume does not at all account for the belief or expectation that every event or object is connected with some other as its attendant cause or effect. His analysis, admitting it to be sufficient for those cases to which it is applied, would only explain why some few events are connected with certain others as causes or effects, but does not show at all, why it is believed that *all events* are so conjoined, nor why the mind is restless or unsatisfied, till it has discovered to every event its antecedent or subsequent known as cause or effect.

The resolution of the objective reality of this connection into a mere subjective association of the two terms fails to satisfy the mind, because it does not account for what is believed. How the mind comes to think of the one when the other is observed or thought of, is a very different question from this, 'how or by what relation does the mind believe that the objects thus thought of together, are connected in fact?' It is a mere truism to say that objects observed or thought of together will be conjoined by association. That the mind is determined to think of the one by means of the other, is not the same thing as that the mind is determined to believe that the one is the cause of the other.

A special appli-
cation of his
general theory.

It should be remembered, in justice to Hume, that his theory of causation is only a special application of his general theory of knowledge—that belief or knowledge of every kind and in respect to all sorts of objects is only a vivid suggestion of an "*idea*" by an "*impression*" or another "*idea*." In the language of later philosophers it would be called an "*inseparable association*" of one with the other. That Hume should apply this general definition to the special case of causation is no more than was natural or consistent, cf. § 43.

The theory of
Dr. Thomas
Brown.

The Theory of Dr. Thomas Brown is closely assimilated with the theory of Hume in certain features, though it is far removed from it in others. Brown agrees with Hume that the relation of cause and effect is nothing more than the constant and invariable connection of two objects in time,—the one as antecedent and the other as consequent. Brown differs from Hume in holding that two objects need only be conjoined in a single instance in order to be known as cause and effect respectively, while the theory of Hume requires that they must be frequently conjoined in order to be causally connected. Indeed the whole force and meaning of Hume's causal connection depends upon the tendency of the mind to think of those objects together which have been observed to be conjoined in fact. Brown contends that the only use of repeated observations is to enable the mind to analyze or separate complex objects into their ultimate elements; for a single conjunction of any two clearly distinguished objects gives their causal connection. Hume makes our conviction of the reality of this connection to consist in and depend upon the mind's tendency to associate objects customarily united. Brown resolves this conviction into *an original necessity or law of our nature*.

"A cause, therefore, in the fullest definition which it philosophically admits, may be said to be, that which immediately precedes any change, and which, existing at any time in similar circumstances, has been always and will be always, immediately followed by a similar change. Priority in the sequence observed, and invariableness of antecedence in the past and future sequences supposed, are the elements, and the only elements, combined in the notion of cause. By a conversion of terms, we obtain a definition of the correlative effect; and power, as I have before observed, is only another word for expressing abstractly and briefly the antecedence itself and the invariableness of the relation."—*Inquiry into the Relation of Cause and Effect*, Part I. sec. 1. Cf. *Lectures*, Lec. vii.

The Theory of
John Stuart
Mill.

The theory of both Hume and of Brown has in its essential features been so entirely reproduced by J. S. Mill and so carefully elaborated in its application to the philosophy of Induction, that a consideration of it in its more fully developed form is required. Mill is the best representative as well as the ablest advocate of that philosophy which denies all original intuitions and necessary truths, and resolves our beliefs of this sort into inductions or inseparable associations, acquired or confirmed by often repeated experience. His views deserve a careful consideration by all those who would be thoroughly acquainted with the course of modern speculation. They are fully and fairly stated in his own language, in the following passages from his *System of Logic*.

"The law of causation, the recognition of which is the main pillar of inductive philosophy, is but the familiar truth, that invariableness of succession is found by observation to obtain between every fact in nature and some other fact which has preceded it." * * "To certain facts, certain facts always do and as we believe always will succeed. The invariable antecedent is termed the cause; the invariable consequent, the effect; and the universality of the law of causation consists in this, that every consequent is connected in this manner with some particular antecedent, or set of antecedents. Let the fact be what it may, if it has begun to exist, it was preceded by some fact or facts, with which it is invariably connected."—B. III. c. v. § 2.

"It is seldom, if ever, between a consequent and one single antecedent, that this invariable sequence subsists. It is usually between a consequent and the sum of several antecedents, the concurrence of all being requisite to produce, that is, to be certain of being followed by, the consequent."—B. III. c. v. § 3.

"As to the ulterior question, whether it is strictly necessary that the cause or assemblage of conditions should precede, by ever so short an instant, the production of the effect?—we think the inquiry an unimportant one. There certainly are cases in which the effect follows without any interval perceptible to our faculties; and when there is an interval we cannot tell by how many intermediate links, imperceptible to us, that interval may really be filled up. But even granting that an effect may commence simultaneously with its cause, the view I have taken of causation is in no way practically affected. Whether the cause and its effect be necessarily successive or not, causation is still the law of the succession of phenomena. Every thing which begins to exist must have a cause; what does not begin to exist does not need a cause; what causation has to account for is the origin of phenomena, and all the successions of phenomena must be resolved into causation. These are the axioms of our doctrine. If these be granted, we can afford, though I see no necessity for doing so, to drop the words antecedent and consequent as applied to cause and effect. I have no objection to define a cause, the assemblage of phenomena, which occurring, some other phenomenon invariably commences or has its origin. Whether the effect coincides in point of time with, or immediately follows, the hindmost of its conditions, is immaterial. At all events it does not precede it; and when we are in doubt, between two coexistent phenomena, which is cause and which effect, we rightly deem the question solved if we can ascertain which of them preceded the other."—B. III. c. v. § 6.

"With respect to the general law of causation it does appear that there must have been a time when the universal prevalence of that law throughout nature could not have been affirmed in the same confident and unqualified manner as at present. There was a time when many of the phenomena of nature must have appeared altogether capricious and irregular, not governed by any laws, nor steadily consequent upon any causes." * * "The truth is, as M. Combe has well pointed out, that (although the generalising propensity must have prompted mankind from almost the beginning of their experience to ascribe all events to some cause more or less mysterious) the conviction that phenomena have invariable laws, and follow with regularity certain antecedent phenomena, was only acquired gradually; and extended itself

as knowledge advanced, from one order of phenomena to another, beginning with those whose laws are most accessible to observation."—B. III. c. xxi. § 3.

"I apprehend that the considerations which give, at the present day, to the proof of the law of uniformity of succession, as true of all phenomena without exception, this character of completeness and conclusiveness, are the following: First, that we now know it directly to be true of far the greater number of phenomena; that there are none of which we know it not to be true, the utmost that can be said being that of some we cannot positively, from direct evidence, affirm its truth," etc., etc. "Besides this first class of considerations there is a second, which still further corroborates the conclusion, and from the recognition of which the complete establishment of the universal law may reasonably be dated. Although there are phenomena, the production and changes of which elude all our attempts to reduce them universally to any ascertained law, yet in every such case, the phenomenon or the objects concerned in it, are found, in some instances, to obey the known laws of nature. The wind, for example, is the type of uncertainty and caprice, yet we find it in some cases obeying, with as much constancy as any phenomena in nature, the law of the tendency in fluids to distribute themselves so as to equalize the pressure on every side of each of their particles; as in the case of the trade-winds and the monsoons." * * "When every phenomenon that we know sufficiently well to be able to answer the question, had a cause on which it was invariably consequent, it was more rational to suppose that our inability to assign the causes of other phenomena arose from our ignorance, than that there were phenomena which were uncaused, and which happened accidentally to be exactly those which we had hitherto had no sufficient opportunity of studying. It must, at the same time, be remarked, that the reasons for this reliance do not hold in circumstances unknown to us, and beyond the possible range of our experience. In distant parts of the stellar regions, where the phenomena may be entirely unlike those with which we are acquainted, it would be folly to affirm confidently that this general law prevails, any more than those special ones which we have found to hold universally on our own planet. The uniformity in the succession of events, otherwise called the law of causation, must be received not as a law of the universe, but of that portion of it only which is within the range of our means of sure observation, with a reasonable degree of extension to adjacent cases. To extend it further is to make a supposition without evidence, and to which, in the absence of any ground from experience for estimating its degree of probability, it would be ridiculous to affect to assign it."—B. III. c. xxi. §§ 4, 5.

Summary of
Mill's Theory.
Its relation to
the theories of
Hume and
Brown.

The doctrine contained in these extracts may be summed up in the following propositions. Causation does not imply production, dependence, efficiency or force, but simply uniform succession or constant conjunction. All events or begun existences are or may be presumed to be invariably preceded by certain events, more or fewer, in a set or assemblage. Each one of these is as truly a cause as any other.

The law or principle of causation, according to Mill, is the ascertained fact or general proposition that every event is preceded by or connected with some invariable combination or set of events.

The conviction that this is the law of all events in the universe is deemed by Mill to be an original or necessary intuition, but is asserted to be a generalized belief which is gradually acquired as the result of inductions applied more and more extensively in the observation of the facts of the universe. But induction is resolved by Mill into inseparable association, so that in the last analysis or ultimate resolution of the ground of our belief in the principle of causation, Mill and Hume are one. Brown, on the other hand, contends that the conviction is original and necessary, or at least that there is an irresistible tendency in our nature towards such a belief. On the other hand, Brown resolves many of our apparently necessary beliefs into "inseparable," or more precisely, insuperable associations. So that Mill finds in the general drift and tendency of Brown's Philosophy

an authority for the prevailing spirit of his own views concerning intuitive truths.

Time-relations attend, but do not constitute the causal.

§ 592. Against the views of Mill and others, we contend that the relation of causation cannot be resolved into any relations of Time. Our reasons are these. It is conceded by Mill, that in some cases, no interval of antecedence or succession can be discerned between the cause and the effect. Under the pressure of this undeniable fact, he contends that though this is true, yet all those cases in which we have occasion to resort to the law of causation, are cases of begun existence, in which the cause is obviously before the effect. He insists therefore that "*practically*" his view of the nature of causation cannot be controverted. This we grant, so far as to allow that in every instance in which we have occasion to discover a cause or predict an effect, the event is a begun existence. In other words, practically every caused existence is a begun existence, and every cause *precedes* its effect, and every effect *follows* its cause: or, which is the same thing, the relations before and after always attend the relation of causality. This is simply the truism that all events [*i. e.*, all begun existences or phenomena] occur in time, or stated in another manner, that all things finite are subject to time-relations. To this should be added the consideration that if there be any higher relations, such as those of cause and design, these must be expressed in language taken from space, and in turn involve the recognition of Time-relations. But it is one thing to assert, which is all that Mill does in this passage, that we can determine causes and effects by means of their constantly attending relations of time, and quite another to show that the two relations are identical.

Time-relations cannot explain deduction.

That they are not identical is proved by the fact that without the assumption of the relation of causation as distinct and logical, deduction would be impossible. This has been shown in the analysis of deduction already given. Induction also would be unmeaning. It is idle to contend that the force of the reasons and laws by which we explain and predict events is exhausted by resolving them into uniform antecedences, and successions in time. This has been already shown under Induction. It will be more conclusively proved when we consider in its place the explanation of Induction given by Mill in his own theory of the nature of the causal relation, § 593. This explanation not only fails to satisfy the mind in respect to induction but it reacts against the underlying or assumed construction of the causal relation. But aside from these considerations, we contend that the very statement of the proposition is its own sufficient refutation. The human mind clearly distinguishes the relations of time from the relations of *causality* and of *production*. The intelligent and universal use of the whole vocabulary of terms appropriate to each of these classes of relations is but the constant attestation that this distinction is made *universally* and necessarily by the mind; in other words, that causation cannot be resolved into any relation of time.

We have already argued that causation is not only an original relation, discerned by intuition, but that it is also known by intuition to be *universally* applicable to all events.

Seven theories
opposite to our
own.

This opinion, as we have seen, is disputed by many. Various counter theories have been devised to account for its *universal* or its *very general* application. Seven such theories are clearly distinguishable, making eight in all—including our own. They are ingeniously arranged and tabulated by Hamilton. *Met. Lec.* 39. The table is more ingenious than sound in its classified subdivisions, as will be apparent from the remarks which we make upon some of its heads; but it may be used as a guide in our discussion.

"A TABULAR VIEW of the Theories in regard to the Principles of Causality.

JUDGMENT of CAUSALITY, as,	A. <i>d posteriori</i> .	a. Original or Primitive.	1. Objective-Objective and Objective-Subjective.—Perception of Causal Efficiency, external and internal. 2. Objective-Subjective Perception of Causal Efficiency, internal.
		b. Derivative or Secondary.	3. Objective.—Induction, Generalization. 4. Subjective.—Association, Custom, Habit.
	B. <i>d priori</i> .	c. Original or Primitive.	5. Necessary: A special Principle of Intelligence. 6. Contingent: Expectation of the Constancy of Nature.
		d. Derivative or Secondary.	7. From the Law of Contradiction, <i>i. e.</i> , (Non-Contradiction). 8. From the Law of the Conditioned."

Causation inex-
plicable by In-
duction or asso-
ciation.

§ 593. The theories which we shall first consider are the third and fourth of Hamilton's Table, according to which, our belief in the Principle of Causality is acquired by Induction like other generalizations, or is the result of Association. These, as we have seen, are the theories respectively of *Mill* and *Hume*, or rather they are by *Mill* blended into one.

The advocates
overlook the real
question.

Neither of these theories is sufficient to explain this belief. This is evident for the following reasons.

(1.) Its advocates *overlook the real question at issue*. The belief to be explained or accounted for, is, that *every event has a cause*. The belief which the advocates of this theory seek to account for, is the belief that to each particular event or class of events, some definite cause *has been or may be actually assigned*. That this last only, can be the product of experience is obvious. That this is the belief in support of which they adduce illustrations and arguments is evident from the passages which we have quoted from *Hume* and *Mill*. That this is not the belief which is in question, needs no illustration or argument.

Experience cannot go beyond its own limits.

(2.). No simple experience of actual events can establish the application of its results any further than the range of *actual events of which we have had this experience*. But in both Generalization and Induction, we go far beyond our actual experience. When from the observation of a few objects or a few events, we generalize a concept or a law which we apply to objects or events more or less like them, we use the belief that what we have observed will prove true of what we have not observed. Whether what we have observed are called simple uniformities of antecedence and succession, or uniformities of causation, makes no difference with the nature of the act by which we pass from the known to the unknown.

Mill himself most pertinently observes: "We believe that fire will burn to-morrow because it burned to-day and yesterday; but we believe precisely on the same grounds that it burned before we were born, and that it burns this very day in Cochin-China. It is not from the past to the future [only or as such] as past or future, that we infer, but from the known to the unknown; from facts observed to facts unobserved; from what we have perceived, or been directly conscious of, to what has not come within our experience."

He also admits, in the passages already quoted, that we do not limit ourselves to experience. In asking why, when we cannot assign a definite cause for an event, we yet believe it to be caused, he says it is "*more rational to suppose* that our inability to assign the causes of other phenomena arose from our ignorance than that these were phenomena which were uncaused." While then he insists that we have no warrant from experience in applying the results of experience "to circumstances unknown to us and beyond the possible range of our experience," and contends that "the law of causation must be received not as a law of the universe, but of that portion of it only which is within the range of our means of observation," he is careful to subjoin "*with a reasonable degree of extension to adjacent cases*." It would be difficult to give a meaning to the phrases "*it is more rational to suppose*," and "*with a reasonable extension to adjacent cases*" without finding in them a real, though unwilling, homage to the intuition "*Every event must be caused*."

Induction assumes and requires the belief to be original.

(3.) *Induction assumes this belief* as already present to, or ready to be applied by the mind. Mill concedes that Induction itself has its axioms. He says, "whatever be the best way of expressing it, the proposition that the course of nature is uniform, is the fundamental principle, or general axiom of Induction." The Proposition that 'the course of nature is uniform' must mean that the unknown uniformities of succession or causation correspond to those which are known. If this is a general axiom or fundamental principle of Induction, it would seem that it cannot be gained or derived by means of Induction. And yet Mill contends that *the axiom which is necessarily assumed to give meaning and reality to the process of Induction is acquired by means of the process to which it is a necessary pre-condition*.

Much less explicable by association.

(4.) The resolution of this belief into *tenacious or inseparable associations*, or as Hume more bluntly expresses it, into "*custom or habit*" is more *palpably untenable* than the other theory or form of this theory.

We have seen already that the fact that the mind is constantly determined to one thought by the presence of another, is very different from the fact that the things thought of, are necessarily determined the one by the other. If the two are viewed simply as psychological experiences, even the subjective law by which the objects concerned are presented to the mind in constant conjunction, is clearly different from the subjective belief that the objects so presented, *are united causally*.

The philosopher who directly, like Hume, or indirectly like Mill, resolves the principle of causality into the law of association, complicates rather than simplifies the problem. For he imposes upon himself the obligation to show that the objective world without corresponds to the subjective world within. This must be done by deduction, induction or intuition, but deduction and induction both rest upon intuition, so that even the theory which attempts to dispense with intuition must in the final analysis rest upon it, in one form or another, as its ultimate arbiter.

§ 594. The two other theories which resolve the principle of causality into the observations of experience, ascribe it to our sense-perceptions of the phenomena of matter, and to our conscious experience of the phenomena of the soul. Some writers, again, hold to both of these conjointly as sources of the belief.

Locke seems to advocate, in different passages of his *Essay*, every one of these theories. The following passages may be fairly taken to represent each of the three :

"In the notice that our senses take of the constant vicissitude of things, we cannot but observe that several particulars, both qualities and substances, begin to exist; and that they receive this their existence from the due application and operation of some other being. From this observation we get our ideas of cause and effect. That which produces any simple or complex idea, we denote by the general name, cause, and that which is produced, effect. Thus finding in that substance which we call wax, fluidity, which is a simple idea that was not in it before, is constantly produced by the application of a certain degree of heat, we call the simple idea of heat in relation to fluidity in wax, the cause of it, and fluidity, the effect."—*Essay*, B. II. c. xxvi. § 1.

"A body at rest affords us no idea of any active power to move; before it is set in motion itself, that motion is rather a passion than an action in it. For when the ball obeys the stroke of a billiard-stick, it is not any action of the ball, but bare passion."

"The idea of the beginning of motion, we have only from reflection on what passes in ourselves, where we find by experience, that barely by willing it, barely a thought of the mind, we can move the parts of our bodies which were before at rest. So that it seems to me, we have from the observation of the operation of bodies by our senses, but a very imperfect, obscure idea of active power, since they afford not any idea in themselves of the power to begin any action, either motion or thought. But if from the impulse bodies are observed to make one upon another, any one thinks he has a clear idea of power, it serves as well to my purpose, Sensation being one of those ways whereby the mind comes by its ideas; only I thought it worth while to consider here by the way, whether the mind doth not receive its idea of active power clearer from reflection on its own operations, than it does from any external sensation."—B. II. c. xxi. § 4.

The theory in all its forms untenable.

Locke's view has been understood to be, that by simple observation and experience of material or spiritual events, we know that they are connected as causes and effects, and that on the ground of the experience thus given in sense and consciousness, we believe, conclude or infer that all events are so connected. To the theory as thus interpreted the reply is decisive; *First*, that simple experience of the known can of itself furnish no warrant for a belief concerning the un

known, unless we apply or assume some *à priori* principle or original intuition: *Second*, Sense-perception and consciousness are usually so defined as to exclude the discernment of any relation except the relations of space and time, or the connection of the objects appropriate to each by any relations other than these. But the relations of space and time are *à priori*, and are discerned by intuition. If the relation of causation is discerned in each of these classes of acts, it is none the less *à priori* for that reason, so that it cannot be urged that sense and consciousness as forms or acts of simple experience, are the source or sources of our belief of causation. The knowledge must be *à priori*, and cannot be *à posteriori*.

The opinions of *Locke* are of great interest and importance in that they gave the occasion or authority for the speculations of *Hume* and *Mill*. *Hume* takes up the positions of *Locke* in detail, and considers them at length. He denies that in Sense-Perception, we can by sense be said to perceive the causation of material objects or phenomena. All that we perceive, he urges, are one material object or state followed by another, using precisely the same arguments against this view of *Locke* which *Locke* uses against himself, when he would show that matter gives no clear idea of power. *Malebranche* uses the same argument and even the illustration by billiard-balls.

This argument is decisive, as we have already observed.

Inconsistent with *Locke's* doctrine of knowledge.

effect, viz., the bodily or psychical state were known under the relation of the simple agreement of their ideas.

Hume's objection to the doctrine of *Locke*.

The opinion of *Locke*, as expressed in these and other similar passages, is interesting for the reason that it is strikingly and happily inconsistent with his definition of knowledge as the discernment of the agreement or disagreement of our ideas. The consciousness of the exercise of power in mental phenomena is certainly a species of knowledge, but it would not be maintained that the cause, i. e., the acting ego, and the effect, viz., the bodily or psychical state were known under the relation of the simple agreement of their ideas. Against the special opinion of *Locke* that we derive the notion of causation from our internal experience, *Hume* contends, that all which we observe is one thought succeeding another thought, one emotion following another, one so-called purpose springing up after another; but we have no knowledge of any causation or production in such cases, nor of any producing agent. The motions of the body which are ascribed to an effort or purpose of which we are said to be conscious, he disposes of by asserting that all we know is—first, that we experience a wish or purpose, and next that this is followed by a bodily movement. In phenomena that are purely mental, where the so-called effect is a purely spiritual phenomenon, the same is true; we find a wish, or purpose, or effort, and it is followed by the desired or purposed mental state. We are simply spectators, but in no case producers or originators, of these *psychical* or *psycho-corporeal* phenomena. Both *Brown* and *Mill* dispose of *Locke's* representations in substantially the same manner. The convenience of these views as furnishing materials for the refutation of the arguments for the freedom of human volitions derived from the consciousness of the exercise of the power or freedom of choice, must be obvious to every one. If in consciousness we are only aware of the presence of psychical states, and cannot know their relations to one another or to the agent which originates them, then it is impossible that we can be conscious of any exercise of the power of choice, for if it be insisted that we are only conscious of the act of choosing as preceding the effect—viz., the state of choice or the purpose, we should only know it as one event preceding another, i. e., we should only know the two events as before and after.

Theories of *Royer Collard* and *M. de Biran*.

§ 595. The question thus discussed between *Locke* and *Hume* has been invested with a special interest by the speculations of *Royer Collard* and *Maine de Biran*, two distinguished philosophers of the modern French school.

Royer Collard, *Fragments de Leçons* (*Œuvres de T. Reid*, T. iv. p. 296), contends that our experience of psychical phenomena gives us direct knowledge of the causal relation, inasmuch as mental states are, by their

very nature, known to be caused by the *ego*. We know by consciousness that we are causes, and these are the only causes which we do know. We know that every event is caused, as a self-evident and intuitive truth.

Maine de Biran, *Œuvres*, T. iv., expands this general statement into a refined theory which he explains with great subtlety, and defends with equal boldness. Taking his cue from Leibnitz, who contends that we have a direct appreciation of the *ego*, and that every monad both material and spiritual is conceived and believed to be an individual force; appealing also to the well-known doctrine of Descartes, that the *ego* knows that it exists because it knows itself to think, or, more exactly, because it finds itself in the act of thinking; he proceeds to assert and defend the following propositions:

The soul, in all its higher states and elements of states, is not receptive but active. As active, it is the originator or producer of effects. These effects are of two sorts: those which are purely psychical, and those which are external as they affect the body and originate motion. In these last even, we distinguish between the element which is purely organic—whether sensitive and receptive on the one hand, or impulsive and reflex on the other, *i. e.* so far as they are purely corporeal and the object of physiological research,—and the element which is psychological and apprehended by consciousness. In those states which are purely psychical, and in the other states so far as they are such, consciousness distinguishes between *the ego*, *the ego in action*, and *the result of the acting of the ego*. These elements are not distinguished as following one another in time, but as separate in thought, even when united in an act or state that endures but for an instant. But here he is careful to observe,

(a.) The *ego*, discerned or *apperceived*, is not the soul as a substance, for this is a generalized conception, and includes the relations of the soul to the body, as well as its various capacities or faculties for the various modes of psychical action. All that is apperceived is the individual *ego*.

(b.) The *ego* thus apperceived is known not as out of action, nor as prepared for action, but *as acting*, as therefore related to or connected with an action—this being an *individual act* however, and in no sense one that is generic; every thing that is known directly to consciousness proper being individual.

(c.) This action is also causal or productive action. In its very nature and essence it is known as passing into effects. These effects are by apperception distinguished from the agent and the action, not in time but in fact.

These positions comprise the answer given by de Biran to the question, Whence and how does the soul gain its notion of causation?

But the inquiry which is invested with still greater interest and importance, concerns the *principle of causality*. It being granted or assumed that the soul derives its knowledge of causation from the direct knowledge

of itself as an individual cause; How does it know that every event has a cause?

To this question de Biran would reply: On occasion of the individual apperception described, we extend the causative relations to objects other than ourselves, by a principle of natural induction or analogy.

"The necessity, invariableness and unity of the personal primitive cause being thus conceived, every inference or derivation from this primitive fact must necessarily partake of the same characteristics. For example, every effect of the locomotion of one's own body being inseparable, so far as I am concerned, from the feeling or (external?) apperception of myself as its cause, no external movement [of any kind can possibly occur without being immediately conceived as like my own (*à l'instar du moi*). This first induction, which transfers the causality of the *ego* to the *non-ego*, has no relation to those judgments of analogy which are founded on resemblances in external experience. For this reason it is with regret and for lack of a better term, that I employ in this novel sense the term Induction, which in logic and in physics has a meaning entirely different. However it may arise, the certainty that every external motion, every passive modification of our sensibility, every fortuitous event whatever, not produced by our personal will, could not begin without a cause, this certainty is as infallible and as necessary as that of our own causality from which it is derived.

"Causality or force, thus conceived separately from myself, and de-subjectivized, cannot be understood except as universal and absolute, like *being*, *permanent substances*, etc., and the other fundamental notions of which the understanding cannot divest itself, and which must be regarded as its inherent forms. It is a very false and very limited philosophy which sees in these notions, and in causality which is the mother of them, only simple signs, or artificial ideas, higher genera, products of sensation, deductions of reasoning, etc., etc.—*Œuvres*, T. IV. pp. 398, 4.

Such is the theory of de Biran in respect to the second point of inquiry, viz., the origin of the belief that every event is caused. It may be stated in a single proposition, viz., we believe all events external to our own experience to be caused, because we conceive of all such events by natural induction, after the likeness or analogy of that spiritual causation of which we are directly cognizant in ourselves.

§ 596. In respect to both these points we ask, How far is the theory of de Biran correct?

Is the theory correct?
1. Do we gain the notion of power from consciousness?

1. Do we gain our first knowledge of causation from the experience of our personal causality? We answer, Yes.

The soul cannot act without distinguishing the *ego* from its acts and their products. It knows itself to be the actor or originator of its active states. In this conscious exercise of its own active energy, it has its first knowledge and individual exemplification of the causal energy in general. It has a direct knowledge of the terms or objects concerned, viz. the agent and the result. It has experience of effort or action in varying degrees. It has also experience of the feeling of pleasure or pain which attends the efforts in question. Its belief of the acting of other causes external to itself, whether of spirit upon matter, of matter upon spirit, or of matter upon matter, is in contrast with this knowledge, incomplete in respect both to the terms or objects concerned, and their relations to one another.

2. Do we make it universal by natural induction?

2. Do we, by natural induction, make a universal application of our individual experience to every possible event? The so-called natural induction of de Biran must rest upon or

involve an intuition, equivalent to the *a priori* principle, every event must

have a cause. Otherwise it is impossible to see what warrant we have to transfer what is true of an individual experience to the whole spiritual and material universe. The fact that *psychologically*, we have the earliest and most complete knowledge of the causal relation in our spiritual experience, does not in the least explain *philosophically*, why it is that we believe this relation to be of universal application.

De Biran's view of first principles.

De Biran is very earnest in the effort to show that this Natural Induction does not suppose that the mind is furnished with primitive beliefs or *a priori* truths (Cf. iv. 388-396). He concedes, indeed, that the mind must have such principles in order that it may reason and judge, but he insists that it does not set off in its processes with these principles already formed, but that an important point is gained when psychology furnishes a starting-point in the actual experience of the soul, from or by which the soul may effect a transition from individual and concrete facts to universal principles. These principles are not gained in the way of ordinary abstraction nor are they generalised notions of the qualities of objects, but they express the sameness of a relation wherever it is realised.

But these reasonings hold only against the extravagant views of First Truths which we have so fully discussed § 528. They prove only that the principle of causality is not first apprehended in the abstract but exemplified in the concrete, and that this concrete is given in the psychical experience of each individual. The extension of this to every event as the occasion arises, must involve the application of what, when it is generalised and reflected on, is known to be a universal principle. This process of extension, called by him a Natural Induction, must involve such an Intuition.

We image our concepts of causality by conscious experience.

§ 597. In insisting that we conceive of external events as caused, after the analogy of our personal causality, *à l'instar du moi*, he has reference to the source from which we derive our images of the causal relation. As every general term of quality, like *red, yellow, etc.*, is illustrated or exemplified to the mind by some concrete instance or image of its use (§ 424), so is it with the more general and more evanescent terms of relation. The law holds more eminently in the latter case. If we cannot use the words *purple, yellow, lovely, fearful*, of an object absent from our direct inspection, without referring to some concrete example, much less can we apply the terms of causality to objects of which our knowledge is indirect and incomplete, without referring to some concrete example from that knowledge which is most distinct, viz., which is furnished from our own souls. The *à l'instar du moi* of De Biran refers to the illustration, the imaging the abstract and the general, but does not explain at all the process by which the intuition is gained, or the authority on which it rests.

There are still other reasons why the activity which we individually exercise should be made the type and image of that causality which we generalize of the universe of matter and of mind. One of the most frequent cases of the exercise of the causal energy is in the management and control of our bodies by means of bodily or muscular force. In the simple tension of muscular fibre, there is often the sense of resistance. The muscular feeling is the same, whether the soul acts upon the muscles, or whether there is a counter force exerted by another being like ourselves, or whether the muscles encounter some one of the forces of nature. The conception of force or effort, in all these cases, takes its image or illustration in part from this fact of muscular tension that is common to the three classes of supposed origination—my own spirit, the spirit of another, and an agency purely material. But the only case in which it is most fully and vividly experienced is that of effort originating with myself.

The inferences of children and savages explained.

This analysis of de Biran's theory enables us to explain the phenomenon to which he attaches great importance, viz., that children, and certain savage races, believe every event to be caused by a spiritual force, and regard every existing thing at first as a living person. The fact may or may not be as universal as he contends it is. He uses it in support of the two positions which we have explained and discussed.

The fact, if it be true, is equally consistent with the construction which we have given to

these positions. On the supposition that we believe by intuition that every event is caused it would still be true that all external causes might be *imaged* after the example or illustration of the spiritual causation which we consciously exercise. Nothing would be more natural than that the non-essential as well as the essential elements furnished by our experience, should enter into the picture, and that our first and unreflecting belief should be that every thing which manifested force was, like ourselves, a living person. The illusion would remain with those whose intellects are controlled by imagination rather than by reason, and would return with a force almost insuperable on every occasion when the imagination was excited by emotion. The child, the savage, and even the civilized man, when maddened by passion, vent their rage against the stone that bruises or the weapon that wounds them, as though they were alive. By a gradual experience, the uninstructed child is forced to distinguish between persons and things. It might require a long time for an unreflecting and passionate community to rise above such illusions of the imagination, when stimulated by the excitement of passion or superstition. In a cultivated community, the child soon learns to accept the judgment of others, as it is forced upon him by the distinctions of a mature language embodying the results of the observations and inductions of many generations. A savage tribe must feel out its way for itself without such aid, and is in constant danger of relapsing into fetishism and superstition in respect to some single material objects, after it has learned in part to distinguish between persons and things.

It, however, by no means follows that the intuition, 'every event is caused,' is equivalent to the proposition, or involves the belief in the first instance, 'that every event is originated by a personal cause.' Origination under conditions or the application of force as the necessary means of explaining the existence of every being and the occurrence of every event, is the general fact which this intuition, and which the principle of causality which expresses it, declares. The distinction between spiritual and material causes is learned by experience, as it is instructed by appropriate evidence.

Inferences from the theory that causation pertains only to spirit.

§ 598. From the fact assumed or believed that the soul derives its first notion of cause from its conscious activity, the inference has been derived that causation is predicable of spirit only; that a material cause is contradictory in conception and impossible in fact. This inference has been held in two forms.

Material causes called self-contradictory.

(1.) It has been inferred, *first*, that the conception of a material cause is self-contradictory; because, forsooth, our knowledge of the causal relation is derived from our own psychical activity. Spirit alone, it is contended, is essentially active and causal, and in spirit, will is that only which is active. Matter is incapable of force; it presents the appearances of antecedent and successive phenomena, but behind these appearances there is no force except what spirit imparts.

"The word *action* itself has no real significance except when applied to the doings of an intelligent agent; we cannot speak of the *doings* of matter as we could if the word *action* were applicable to it in any other than a figurative sense. Let any one conceive, if he can, of any *power*, *energy*, or *force*, inherent in a lump of matter—a stone, for instance—except this merely negative one, that it always and necessarily remains in its present state, whether this be of rest or motion. * * * We attribute *force* or *power* to the particles of matter and speak of their natural agencies. Just so we talk of *tone* in coloring, and of a *heavy* or *light* sound; though, of course, in their proper significance, *tone* belongs only to sound, and *heaviness* to gravitating bodies. These modes of speech are proper enough if their figurative character is kept in view; but we ought always to remember, that agency is the employment of one intelligent being to act for another; force and power are applicable only to will; they are characteristic of volition."

* * * "This doctrine places the material universe before us in a new light. The whole framework of what are called 'secondary causes' falls to pieces. The laws of nature are only a figure of speech. The

powers and active inherent properties of material atoms are mere fictions."—Prof. Francis Bowen, *Lowell Lectures, First Course*, Lec. iv. Cf. Berkeley, *Sirius*, § 154.

§ 599. Against this view the following objections are decisive: (a.) The soul finds in its own positive psychical experience evidence that "force and power are" not "applicable only to will;" for it finds spiritual energies that are neither intelligent nor voluntary. When it seeks and strives to fix its attention, to recall forgotten objects, to control its rebellious desires, it contends against actual forces which are not directly regulated by intelligence or controlled by the will. There are 'secondary causes' in the soul at least, if there are not in matter.

(b.) It does not follow, because we derive the notion of causation or force from the conscious activities of an intelligent will, that the relation itself involves either intelligence or will. Let it be conceded that at first the soul, by a not unnatural illusion, refers every event which it does not produce by its own activity to some spiritual agent other than itself. It soon learns to correct its judgments. It learns that a spirit does not directly blow upon the trees or agitate the sea, for it finds the agitation of the air interposed; it then discovers that this agitation is occasioned by heat; then that heat is dependent upon the sun, or some other agent.

In other words, between the effect and the activity of spirit, it interposes many so-called beings and their actions. What are these agents or phenomena? They are not the thoughts nor the feelings, nor the purposes of another mind. They are not the products of our own causality in thinking, feeling, or willing. They are either the causes of the sensations, or the occasions of the sense-perceptions which we experience. In other words, they are possessed of force and endowed with causal efficiency without either intelligence or will.

What, again, is that which we call the body, that animated something which the soul directs, which resists its energy, and the affections of which cause the soul connected with it to suffer? Shall we say that all these are God, acting in various ways? Then the universe, separately from created spirits, is nothing but God; which approaches the view of Spinoza. Shall we say that these all are the means or media of the acting of God? But if they are media or means, they themselves are not the same with God's acting. What are they? What has God made them to be in order that through them as means, He may act? What is that in the created spirit, in addition to its capacities for intelligence and will, which acts or seems to act independently of knowledge and volition? These questions involve the objection that,

(c.) According to this theory, the universe of matter and of spirit, except so far as it is capable of intelligence, is unreal and impossible. Matter without qualities or powers, is inconceivable. Qualities and powers involve force, i. e., causal energy. The exercise of power is also inconceivable, except by beings capable of voluntary energy.

For these reasons we reject the theory. We distinguish intelligent and voluntary activity from simple causal energy. We distinguish *causa* from *creative* force, i. e., origination under conditions furnished by another

being from origination without such conditions. We distinguish a first from secondary causes.

It has been inferred that there is but one agent in the universe.

§ 600. (2.) The *second* inference derived from the position that the activity of spirit furnishes the notion of causation, is, that there is but one agent in the universe, and He is the Creator; that causation is conceivable of neither created matter nor created spirit, and the apparent activities of both are held to be varied manifestations of His single force, in phenomena successive to one another. If this doctrine were true, it could not be legitimately derived from the grounds alleged, inasmuch as the notion of causality is furnished from a created or finite cause, and is inferred to be inapplicable to any other than a cause which is infinite and uncreated.

Malebranche (*Rech. de la Ver.*, l. 6, p. 2, c. 3.) advocates the theory in question, but not on these grounds, but as an inference from his general theological and philosophical position, that God is the only agent, and that in him we perceive as well as produce every object in the universe.

The theory which resolves causality into a relation of concepts.

§ 601. We proceed to consider, next, the several theories that the principle of causality is *a priori*.—(*Table*, 5, 6, 7, 8.)

One class (*the seventh*) of these theories comprehends all those which resolve this relation between things into some more general relation between concepts—in other words, into some logical axiom, principle, or relation. The fallacy of them all consists in inverting the order of nature and of reason. A correct estimate of logical relations and principles will show that they are all dependent upon some assumed reality of things. Of such realities, the relation of causality is prominent and fundamental.

Resolved into the principle of contradiction.

Hamilton (*Met. Lec.* 39) asserts that Wolf, Clarke, Locke, Hobbes, and others, have attempted to demonstrate the law of causality by the principle of contradiction. He refers particularly to such an argument by Wolf (*Ontologia*, §§ 65–70), a part of which he quotes and repeats. The argument, as he cites it, is as follows: "Whatever is produced without a cause, is produced by nothing; in other words, has nothing for its cause. But nothing can no more be a cause than it can be something. The same intuition that makes us aware that nothing is not something, shows us that every thing must have a real cause of its existence." It may be doubted, from the very terms in which Hamilton cites the argument, whether Wolf intended to demonstrate the law of causation by way of logical inference. So far from attempting to show that its truth can be demonstrated or logically derived, he aims to prove that it cannot be derived at all, but that it is an original principle or axiom of thought, and, as such, is coördinate and equally original with the principle of contradiction; cf. § 75. What is said to be a logical argument, is, in fact, only a reduction similar to those which are employed by many philosophers, when they argue that a principle must be accepted as a first truth, by drawing out the absurd consequences, either speculative or practical, which would follow from the denial or non-acceptance of it as such.

Its relation to the principle of the Sufficient Reason.

It has not been uncommon with the philosophers of the later German Schools to seek to resolve the principle of causality into the principle of the *sufficient reason viewed as a logical principle*. This follows from not clearly determining and carefully keeping in mind the relation of the *ratio essendi* to the *ratio cognoscendi*. Instead of deriving the second from the first, they have derived the first from the second. Because the

logical reason is more general or extensive in its application than the *real cause*, they have resolved cause into reason, instead of explaining reason by means of the relation of cause. We have already shown, under Deduction, that the syllogistic process, and indeed all logical reasoning supposes the *ratio essendi*, i. e., real causal action or that which may be conceived as such, and that without this all deduction is meaningless and inconclusive. § 448.

This inversion of the real order of the dependence of these conceptions may be traced to Kant. He at least sanctioned it by the suggestion that is fundamental to his system, that the forms of thought are not necessarily representative of the forms of being. Kant makes the relation of causality to be in its essence a metaphysical relation of the explicability of one thought by another which is required by the understanding or logical faculty. The understanding must explain one thought as dependent on another: This relation of dependence, when applied to things existing in the actual world, can only be conceived by means of the relations of phenomena to one another in time: The phenomenon that succeeds another uniformly is explained to the understanding by that which precedes it.

It has been carried to its furthest extreme by Hegel in the fundamental position of his philosophy which he boldly attempted to apply to every conception, that all the so-called relations of being may be developed from and are resolved into relations of thought, so that the actual world is but the necessary evolution of the relations that belong to the concept as such. The relation of the reason to its consequent, and by consequence of cause to effect, is only a special application of that law of identity, as interpreted by his logic, which controls and reappears continually in all abstract thought. According to this law, every thing as thought or conceived, is thought or conceived by means of its relation to something not itself—when completely conceived, by its relation to every thing other than itself. As conceived it must therefore depend entirely upon this other. What any thing depends upon, that it may be conceived, is its ground or reason. The relation of dependence, of reason, of causation, is therefore involved in that of identity. In the act of conceiving an object to be what it is, is involved its dependence upon another object in the relation of its ground, reason, or cause.

It is true, in a certain sense, that the objects related make up or constitute the concept of which they are said to be the constituents. If the elements *a* and *b* and *c* constitute any whole *A* (as certain properties constitute chalk,) then they are the grounds, or reason, or cause of *A*, as a concept; but this relation of dependence by which the concept is thought, differs greatly from the relation of production by which the thing is originated. The one cannot be resolved into the other.

The dependence in the one case is that of consistency in thinking. In this case the causality is made by the active mind that originally thought these elements together in a single concept, according to the objective relations which it discerns between the objects thought. But the causality with which we are concerned is a causality between things, which is distinguished from and superadded to these so-called logical relations.

When I compare twenty objects with each other and conceive one as diverse from the other nineteen, these nineteen are necessary to, and the grounds of the concept of, this one as thought to be different from the rest. If five are alike in form or color, the four must be thought of that the likeness of the fifth to the four may be conceived. These five are the reasons, or causes, or conditions, of this likeness as discerned. Heat applied to water causes steam. Steam cannot be thought of except as heat and water enter into the concept, but the belief of the production of actual steam by its actual constituents, implies another relation, than that of mere thought. We form many concepts by means of the relation of causality, it is true, but not every element that is constituent of a concept is causal in the relation of things.

§ 602. *The eighth* theory called *a priori*, is the theory advanced by Sir William Hamilton, *Met. Lec.*, 39, 40. This theory derives our conceptions of, and our belief in, the relation, not from a *power*, but an *impotence* of mind; in a word, it resolves it into the more general "*principle of the conditioned*." The *law of the conditioned* is, that "the conceivable has always two opposite extremes, and that the extremes are equally inconceivable. That the conditioned is to be viewed not as a power, but as a powerlessness of mind is evinced by this—that the two extremes are contradictories, though neither alternative can be conceived or thought as possible, one or other must be admitted to be necessary."

Hamilton's theory of causation.

This general powerlessness gives the special relation of causality, when applied to the two positive forms under which every object is and must be conceived, viz., *existence* and *time*. By the necessity of the *first*, the mind cannot but think of every object as existing. It cannot, if it tries, think of any thing as not existing. By the *second*, the thing existing is not *now* what it was a moment *before*. We cannot think of any object as non-existing in the present. No more can we think of the same as non-existent in the past. We cannot think of its absolute commencement in the past, nor can we think of its absolute termination in the future. Nor can we think of its absolute non-commencement, nor of its infinite non-termination. "This gives us the category of the conditioned as applied to the category of *existence* under the category of time."

By this application of the principle of the conditioned, the principle of causality is gained. For the law of causality is simply this, that when an object appears to commence in time, we cannot but suppose that the complement of existence which it contains, has previously existed; "in other words, that all we at present come to know as an effect, must previously have existed in its causes."

According to this theory, the cause or causes of an object are the sum of the constituent elements of its being, existing at a previous time in a different form; the effects are the same, as existing in another form at a subsequent time. This applies to every form of causation, even to the creation of the universe. For creation is not a springing of nothing into something; "it is conceived, and is by us conceivable merely as an evolution of a new form of existence by the fiat of the Deity."

Similar to this theory in principle, is the theory of Mansel, *Proleg. Log.*, chap. v. We have a positive consciousness of the relation of causality in the action of our own minds, but when we apply this to the phenomena of the material universe, it is only in some negative and inadequate signification. When we thus apply it, we do not use it as an original and necessary principle of knowledge, corresponding to which is a fundamental and universal relation of being, but we simply find ourselves so constituted, that, in the present state of existence and under the laws of our present mental constitution, we cannot *but think* every object under this relation.

The theories of Hamilton and Mansel are in their principle identical with the general theory of Kant, from which they were plainly derived. They all agree in this, that though we are forced in our human thinking and under the laws of our human constitution to believe in causation as universal, yet this necessity may result (Hamilton and Mansel both teach that it does result) from our incapacity to think objects under any other relation, *i. e.*, as they explain this relation. Kant teaches that we are forced to conceive, *i. e.*, *imagine* the relation of causation under the relations of changing phenomena succeeding one another in time. Hamilton states this assertion in a form more positive than that adopted by Kant.

The objections to this positive explanation, so far as it is peculiar to Hamilton, are the following:

§ 603. (1.) It is not true that it is an original and necessary belief that the complement of existence is not changed with the changes of phenomena. For example, when a pile of fuel is consumed by fire, and only an inconsiderable residuum of ashes remains, men do not necessarily and instinctively assert that the total of the original constituents of the fuel is undiminished. So far is this from being true, that, on the other hand, they are slow to accept the evidence furnished by the most careful experiments of science, that the products, when analyzed and gathered after combustion, equal the elements of the substance before it was burned.

Objections. Elements of existence not indestructible.

The impossibility to think of change logical, not real.

(2.) The asserted impossibility to think an object as non-existent is a *logical*, not a real impossibility. We cannot think any thing not to be *in thought*, because, while we think of it, it must exist for us in thought. Even when we think of it as not existing, whether in the present or in the past, we must think of it as existing in thought, and to this object as existing in thought we must deny existence in fact. If we think of a centaur or a hippogriff, we must think of it as being. If, because we cannot *think* of an object actually existing to be non-existent, we may infer that the complement of its existence does not change, we may also infer that, because we must think of a centaur or hippogriff as existing, they also in fact exist.

Does not explain psychical causality.

(3.) The theory is utterly inadequate to explain *psychical causality*. The operations of the soul are, as we have seen, eminently causal. From our conscious experience of this class of actions the first notion of causality is derived. Whether the effects in question are produced by the action of the soul within itself, and are purely psychical, or whether they are wrought in the nervous organism by the soul; whether they are wrought upon matter by the soul, or upon the soul by matter; in each of these cases the theory fails to satisfy. There is no complement of existence appearing in different forms at different times. An effect purely psychical, or physiological, or material, is not conceived as the same constituents under a new form. It is what the terms denote it to be—a product, an effect, a result of activity, a consequent of the power and action which are required for and appropriate to the result.

Incompatible with creation.

(4.) It is still more incongruous with any right notion of *creative causality*. The creation of matter or of mind implies the production or origination into existence of that which did not exist in any of its constituents. It is called by Hamilton, "the evolution of a new form of existence by the fiat of the Deity." But evolution ought, in consistency with his theory, to signify the changing of the materials already existing under one form into some new form; the kind of existence being already in being. This would require either that we believe in the co-eternity of matter with God, and that we restrict the agency of the Deity to the exercise of a merely plastic or formative energy, or it would involve the pantheistic view, that in the spiritual nature or constitution of God there was also present a material substance, from which, by a new evolution of divine action, the created universe emerged, as a new form of the matter which had from eternity existed in God. From spirit as such, from a pure spiritual essence, it cannot be conceived that matter should be evolved, in any consistency with the theory of Hamilton as defined by himself.

(5.) The relation of causality is not special under the general law of the conditioned, if it be admitted that this law is truly stated.

Theory of expectation of constancy of nature.

§ 604. The *third* theory, which is named *sixth* by Hamilton, among the theories *d priori*, is as it would seem, even by Hamilton's own concession, rather recognized for the sake of making his scheme of classification complete, than because it deserves a separate place under either the class *d priori*, or the class *d posteriori*. It is that suggested by Dr. Brown, under the terms of the expectation of the constancy of nature in the succession of events. A close examination of Dr. Brown's meaning will show that he uses expectation as synonymous with *belief* or *intuitional certainty*, as indeed Hamilton himself recognizes.

Conclusion. Our position re-affirmed.

The various attempts to resolve the relation of causality into some other relation either *d posteriori* or *d priori* having failed to be satisfactory, we return with greater confidence to the original position which we have already explained and defended that it is *original* and *intuitive*.

The various applications of the relation and principle of causality in the processes of the intellect, as well as its significance as an assumption fundamental to our higher knowledge, illustrate and enforce its importance. These applications have been already so frequently insisted upon and referred to, that it is useless to repeat them, especially as we shall have occasion to illustrate them at length in Chapter VII.

CHAPTER VI.

DESIGN OR FINAL CAUSE.

From the principle or relation of causation we pass by a natural transition to the principle of design or adaptation, or, as it is usually termed, of final cause. We have already explained that this, in an eminent sense, is a synthetic relation, and in this respect is contrasted with the relation of causality. The movement of the latter is from the individual to the general, from the less to the more comprehensive. The movement of adaptation and final cause is from the general to the particular and the individual. It unites constituent elements into constituted wholes. It follows causes and laws in their movements toward intended effects. It binds together different species and individuals in the unity of a harmonious system. It develops the existence and the events of this system after an order which supposes a definite plan for a definite end. It explains the beings and the powers, the laws and development of this system by a supreme Intelligence.

Terms explained. Formal, material, efficient, and final causes.

§ 605. The phrase or term *final cause* should first of all be explained, and the connection of thought by which it is applied to designate the relation of design. Aristotle and the schoolmen divided all possible or conceivable causes into four; the *material*, *formal*, *efficient*, and *final*. The *material cause* is but another phrase for those material elements or principles of which any existence is composed, whether the matter is bodily or spiritual. The *formal cause* is the property or aggregation of properties which constitute its *essence* or *notional content* (in Aristotelian phraseology, *its form*). It answers to the

belief which we have seen lay at the root of the views of the realistic conception of the correlate to the notion or general term. (§ 426).

In these two senses, the word cause is equivalent to element or constitutive principle, each differing according as that which is constituted is *matter* or *form*.

The *efficient cause* corresponds with the cause of modern philosophy, except that it was formerly appropriated to the most conspicuous or prominent of the agents or conditions that produce a result; whereas, in modern usage, the term is extended to all those agents which, in combination, originate an effect.

The *final cause* was the design or end which was conceived as impelling and directing the action of a number or succession of agencies, till it was actually brought to pass. The propriety or at least the significance of this appellation can be understood by an example. If I form a purpose, as to build a house, to pay a visit, or make great moral or intellectual attainments, the event or result when made actual, will be the *end* of a series of events or actions. Hence the *end*, by a secondary signification, is made to signify a *purposed result* or a design, and the adjective *final* receives and suggests the same import. The purpose is called a *cause*, because it is conceived when formed as prompting or causing those events or acts which are necessary to its realization. Hence the appellation, *final cause*,—i. e., a cause, which, beginning as a thought, works itself at last into a fact as an *end* or *final result*.

Aristotle called the formal cause τὴν οὐσίαν καὶ τὸ τί ἦν εἶναι, the material cause τὴν ὕλην καὶ τὸ στοιχεῖον, the efficient cause εἶδεν ἢ ἀρχὴ τῆς κινήσεως, and the final cause τὸ οὗ εἶναι καὶ τὰ ἐκείνη. *Met.* I. I. 88 a 27, a 29, a 30, a 31.

§ 606. The design conceived as directing or impelling a series of agents to an end, supposes that agencies exist in fact, or may exist, which will bring it to pass. The *capacity* of these *efficient causes* when combined to produce the effect is called their *adaptation* or *fitness* for it. The question is supposed to arise, what causes or agencies must be used in order that it may be effected, or in order that it may be effected in the best or the readiest manner? It is answered by showing that the agencies selected will bring it to pass. This adaptation may be considered *subjectively* or *objectively*. If it is viewed as *arranged* or *known* by the designer, it may be considered *subjectively*. But whether it is known or not, the capacity for or the possibility of it exists and remains to be discovered. It pertains to actually existing forces and laws of nature, and is a relation which may be affirmed of such causes. A series or combination of causes, viewed as *fitted* for an end are called *the means*—literally the intermediate agencies—between the end as thought and the end as produced, and their relation to it, is *adaptation*.

Design and adaptation, how related.

The relation assumed as necessary and *a priori*.

That the relation of design and the means of its execution, often exists and may be traced in both spiritual and material phenomena separately and conjoined together, will be denied by no one. The point which we assert and defend is that this relation is believed *a priori* to pervade all existence, and must be assumed as the ground of the scientific explanation of the facts and phenomena of the universe. We do not inquire whether it is observed in our experience as a psychological fact, but whether it lies at the ground of all our knowledge as a necessary relation of things, and a first principle or axiom of thought—whether, in other words, the principle of adaptation ranks with the principle of efficient causation as a necessary and *a priori* truth.

The kind of knowledge which rests upon efficient causation.

It may aid us to find an answer to the question in the form last expressed, to consider what description of knowledge rests upon the axiom of efficient causation. By the relation asserted in this axiom, we conceive of material and spiritual agents as endowed with powers. These powers are simply causal forces, competent to, and productive of, their appropriate effects. These powers act under their several conditions and according to their appropriate laws. It is the aim of science, as commonly conceived, to discover these powers by close and skilful observation, and to determine their laws by exact analysis and inventive experiment. The wider or narrower range of these powers and laws is also noticed by methodical arrangement, and in this way all beings and phenomena are explained according to their place in a scientific system.

Can final cause be similarly applied?

§ 607. The question which we are now to answer is, whether the relation of design may be applied in a manner similar or analogous, to connect, to classify, and to explain facts and phenomena. Are the relations and laws which are ascertained by asking the questions *why* and *how*, the only relations conceivable, or do other relations hold the same place in our knowledge, viz., those which the question *what for* assumes, and requires as its answer? Aristotle gave the highest preëminence among all the causes to the *ὁ ἐντεκα* or the *what for*. Was Aristotle right in assuming that the end is as important to be known as the definition, the conditions, and the origination of a being or a phenomenon?

Such an application conceded to be desirable.

No one will deny that if it were possible to determine the ends for which every thing exists and every event occurs, and to explain and arrange these beings and phenomena under the relations which the end involves, a new interest would be imparted to the objects thus known, and the mind would experience a special gratification. Many objects are thus explained and arranged, and these results always attend the knowledge of them under these relations. But is this knowledge necessarily assumed as possible of all things and events? Does the mind believe that every thing and every event is connected with every other thing and event under the relation of means and end?

Reasons. The mind impelled to connect objects by this relation.

§ 608. We assert that the relation of means and end is assumed *a priori* to be true of every event and being in the universe, and that the mind directs its inquiries by, and rests its knowledge upon this, as an intuitive principle. Our reasons for the truth of this position are the following:

(1.) The mind is impelled to seek, and is satisfied when it finds that any objects or events are related as means and ends. Whatever these objects may be which are connected under this relation,—whether they are individuals that fill only single points in space and endure but for a moment of time, or whole classes that pervade the entire universe by their agency, and endure with energy unwasted from generation to generation, as the great forces that hold all beings together and minister to all motion and life—the mind inquires, for what do these exist and act? and if it can find an answer, it accepts it with rational satisfaction.

It asks the question and accepts the answer in a way precisely analogous to that in which it inquires and learns, By what agency and under what law does any thing exist and act? It asks as pressingly and as persistently, concerning what it may find in this relation, as concerning what it can know under the relation of causation. When it receives a probable answer, it welcomes it with a more complete and a higher satisfaction than a similar explanation by efficient causes and their laws. This ground of analogy would lead us to believe that the two relations are both original and intuitively assumed.

It forms no ground of objection, that this very argument for the truth of the principle rests on the assumption that the principle itself is true. We have observed that we must assume the truth of these principles in inquiring for the evidence that they are original. We assume the originality of causation, in inquiring whether it is an axiom of thought. In like manner we not only may, but we must assume design in proving that design is an original and ultimate category of knowledge and of things.

The relation is higher than that of efficient causation. § 609. (2.) The relations under which this axiom requires that objects should be connected, is higher than that by which they are united under the category of efficient or blind causative force. The relation of means to ends supposes that of cause and effect. We must first suppose causes or agents to exist, before we can suppose them to be applied or employed as means. Objects must be thought of as endowed with permanent powers, which act after fixed laws under recurring conditions, in order that these powers, conditions, and laws may be so disposed and arranged as to produce a designed effect. If there are no such forces and laws, there are no materials in respect to which adaptation can exist, or through which it can be made manifest or interpreted.

But when these are ascertained, and by them unity and order and dependent relationships are established among the otherwise disconnected beings and events of the universe, the mind takes a step higher in its aspirations, seeking to rearrange under a higher connection objects united under these lower relations. The one being presumed, and in part at least successfully established, the mind believes that a higher is possible, and proceeds to discover it. Subjectively viewed, this relation gives a higher satisfaction. Objectively regarded, it stands higher in rational value than that of efficient causation, which is only a stepping-stone and preparation, with respect to this.

The principle has been of service in scientific discovery.

§ 610. (3.) The principle has been of essential service in scientific discovery. It being conceded that the appropriate sphere of science proper is to develop and establish the so-called

powers and laws of nature, and that the discovery of adaptations lies without its sphere, it is still true that the belief that the universe is full of such adaptations, is of essential service in suggesting powers and laws previously undeveloped and undetermined. The history of scientific discovery abounds in confirmations of this truth.

When Harvey observed that at the outlet of the veins and the rise of the arteries there were lying within each certain valves, in the one opening inward towards the heart and in the other opening outward away from the same; he was persuaded that the arrangement indicated an end, which supposed activities and laws which were not yet known. The functions of the heart and the changes in the blood, so far as known, could not be accounted for by, nor could they account for, this structure. The arrangement of these valves, supposing that it was designed for some use, was most consistent with the contraction and dilatation of the heart and the outflow and return of the blood in a double circulation through the body and the lungs.

Harvey's discovery of the circulation of the blood.

When Cuvier found buried in the drift or the alluvial deposit, the thigh or arm-bone of an animal, and pondered over the depressions and protuberances upon its surface, he observed that they were hollowed and elevated in such a way as to be specially adapted to a single description of muscles. These muscles, in their turn, were adapted to the feet and claws of an animal who could spring upon, hold, and tear its prey. The length and shape of the bone required, by adaptation, bones of correspondent shape and size in the remainder of the limb and in the entire frame. Such a frame as this must be furnished with a peculiar head. Such a head could admit only peculiar jaws, and such jaws peculiar teeth. The teeth and fangs required a stomach and viscera fitted for the digestion of animal food. Guided by his belief in this complete adaptation of part to part, and of parts to the whole, he reconstructed the skeleton and the whole animal indeed, either in imagination or some representative material, in the full confidence that if such an animal did not then exist it had existed once, and this bone had formed a part of its structure. By and by he hears that it exists in some remote part of the earth, or an entire skeleton is disinterred as like as possible to the one which he had built up in his museum.

Further illustrations of the value of this principle in scientific discovery will be given when we treat of its application to the several sciences.

Cuvier's application of it in comparative anatomy.

§ 611. (4.) The entire superstructure of the Inductive Philosophy rests upon the principle in question. This position has been already discussed in part in treating of Induction.

It has been already shown that the Inductive method rests on several assumptions. They are such as these: nature is uniform in her operations and laws; the indications or signs of less obvious powers and laws may be confided in; the analogies of nature are important means of suggesting facts and laws, and of inciting to experiment and discovery; the simplest relationships, the fewest agencies, and the most economical use of forces are always presumed. These and other like axioms of the student of nature are but varied applications of the principle in question; viz., *that in the universe objectively considered, there is an intelligent and wise adaptation of powers and laws to rational ends, and that the same is true of the relation of the universe to the knowing mind.*

It is not sufficient for the philosopher to say that without these assumptions, the science of nature itself would be impossible, inasmuch as the conception of science requires that

The Foundation of the Inductive Philosophy.

powers should be fixed, and laws should be uniform, and indications and analogies should be trustworthy; that were science not to assume the truth of these maxims she would commit suicide. To this it is pertinent to reply, what if science itself should be impossible? What is the imperative necessity for science? The physicist must concede that the adaptations of nature to the methods and impulses of the knowing mind are such as indicate, at least that class of designs in the structure of the universe, which the possibility of science requires.

It is clear that the very axioms of the Inductive process presume the relation of final cause. This of itself goes far to prove that the relation itself is original to the mind, and is intuitively discerned. But this Principle is not only required to sustain and enforce our confidence in the axioms of the Inductive method, but

Required to explain the phenomena of organic existences.

§ 612. (5.) It is also needed to explain those phenomena of organic existence, which the relations of efficient causes are entirely incompetent to resolve or even to define. An organic being, or an organism, can only be defined as a being of which each organ acts for the integrity and well-being of every other organ, and all act together for the life of the whole. More abstractly, and in the terms of the relation in question, an organism is a being in which each of the parts and the whole are respectively means and ends for one another. We find it, in fact, to be true, that in any living being, whether plant or animal, the elements or organs act together so as to promote the action of each other, and of the whole. If the appropriate function of each organ is performed, the functions of every other is also fulfilled, and when all together are exerted they are the conditions of the growth, the development and the several other functions of the plant or animal. In the animal, the action of the lungs is necessary to that of the heart, and the action of the heart to that of the lungs, the action of both to the action of the stomach, and the action of the stomach to that of both these, and the mutual action of these and the remaining organs, to the health and life of the whole body.

Mechanical forces and laws do not dispense with it.

The elements or agents of which these organs are composed, have their well-ascertained mechanical and chemical properties, and when these are combined in inorganic substances, their results follow the laws which control them.

But when they are combined in living beings or their organs, these powers and laws do not explain in the least degree these compounds or their functions. The materials or agents which form the heart, the lungs or the brain, do not at all explain the peculiar substance, form, or functions of these organs; much less do they account for the singular capacity which they possess of producing a whole on which they depend for their own existence as a living heart, lungs and brain, and which in its turn as a living whole is dependent on each of these.

The vital force does not set it aside.

To meet the exigency and to account for these phenomena, a new force has been resorted to by physiologists called the vital force or the principle of life which, it is urged, is as truly proved by these effects to exist as are the several mechanical and chemical agents by and upon which it acts. Others reject the doctrine of a single force as a merely abstract term or fiction for the total of the activities of these several agents to their peculiar results. Whichever of the two views is adopted, whether that of a single force modifying the action of these agents, or of the reciprocal modification by these forces of one another, no law or rule has as yet been discovered in respect to their action which cast any light upon either the formation or functions of the

organs or organisms in question. The same materials combine to form the structure of the heart, the lungs and the brain. And yet under this force, whatever it may be, out of the same constituents are formed these three organs, each shaped according to its typical form and each endowed with its special function. The heart is moulded, divided into cavities and endowed with a rare capacity of perpetual and almost independent activity; the lungs are expanded into an almost gauze-like tissue, through which without rending the texture, the blood can come into chemical combination with the oxygen of the atmosphere; the dough-like substance of the brain is kneaded into unsymmetrical and insignificant forms, which in some way become the organ of the most refined functions of sense and reason. These are so united with other organs as inexplicable as themselves, as by organic actions and reactions to make a living whole, after the law of a species, and yet sustaining an individual life. These facts we observe; these phenomena we generalize, yet only in the rudest way. The laws or processes by which the nitrogen and carbon are made into heart and brain we do not discover. All that we can do, is within the sphere of the mechanical and chemical relations of the constituent elements to observe the resultant products into which they are transmuted; but the laws by which they produce them, are hidden from view. The Inductive philosophy, with its efficient causations, is wholly at a loss: It cannot explain how the agents which form the vegetable or the animal cell should impart to that least microcosm the wonderful power of adding cell after cell to its substance or of developing a new cell from within itself. Much less can it explain why or how it is that one cell is the rudiment of a plant and another that of an animal—that one expands into this plant, and another into that; one into this animal and another into that. All this is totally unknown. The principle of life and the conditions of life are only names for causes that cannot be explained by such methods. The effects cannot even be described much less explained by the relations of efficient causes or powers.

Under these circumstances we resort to the relation of design in order to define and explain the phenomena. The adaptation can be scientifically expressed as follows. The constituent agents, besides the powers, as mechanical or chemical, which they are known to possess, are also so constituted that they can be combined in an organ or an organism, so as to sustain it as living so long as it in turn sustains them as living. Their power to do this is defined only by individual effects, but cannot be defined by any general formulæ. The materials can never a second time share—by giving and receiving—in the same life. That which makes them living, is their relation to one individual life. The variety of these adaptations is as great as the number of individual lives into which they could possibly enter. The action or function of each part and of the whole is as though an intelligence had carefully fitted each to the other, and controlled the mutual action of each by studied adjustments to every individual case.

After no other relation can we explain how dead matter is transmuted into living particles, and how an aggregate of these particles is developed into living organs, which live together so long as the being lives of which they are parts. By no other law than that of design can we explain how each class of living beings works for itself, having a form, habits, tastes, and instincts peculiar to itself, and how each individual of each class is an end to itself, having an individual form, size, and other peculiarities more or less marked, according to its rank and place in the scale of being.

Relations of
adaptation
alone sufficient.

Relation of final to efficient causes in the higher orders of being.

§ 613. Two facts are here suggested touching the relation of final to efficient causes. The *first* is, that the higher we rise in the order of beings, the less we know of the relations of *efficient causes*; but those of *final cause* are *more and more various and conspicuous*. In unorganized matter we have occasion chiefly to apply efficient causes and their unvarying laws. As we rise into the sphere of chemical and crystalline combinations, while many such forces and laws are still clearly distinguished and definitely ascertained, the mystery in respect to both seems to deepen; but the adaptations grow more conspicuous. As we ascend into the regions of life, we are more and more baffled in our attempts to detect the elementary forces and to determine the unvarying laws, but are more and more gratified at seeing the relations of adaptation become more and more conspicuous.

Second: The one of these relations does not displace the other, nor do discoveries in respect to the one either compel or allow us to dispense with the search after the other.

The one does not displace the other.

On the contrary, the more complete is our analysis of efficient forces and our determination of their laws, the greater is the opportunity to notice how the structure whose constituents are exposed by analysis, is controlled by manifest fitness and adaptation. As has already been observed, it is only as physical forces are discerned, that the relations of adaptation can be made manifest. On the other hand, discerned adaptations suggest the possibility of unknown elements, and prompt to the search after them. Each newly discovered element and determined law opens an opportunity for some adaptation as yet unobserved.

Objections: (1.) Men mistake in their judgments about final causes.

§ 614. To the doctrine that the belief in design is intuitive, the following are urged as objections:

(1.) Men mistake in discovering or assigning ends, and the mistakes into which they fall are irrational and foolish; whatever an ignorant or selfish man may think important to himself, he thinks must have been designed in the economy of nature, and is thus in continual danger of setting up his narrow and interested judgments as the real adaptations and intents of the Creator.

It is sufficient to reply that, if men mistake in assigning the ends of phenomena, they do the same in interpreting their causes. It is not at all in question whether men can discover particular ends with infallible certainty, but whether they intuitively believe there are ends to which all beings and agents are adapted, and for which they are designed.

The objection enables us to bring out distinctly the truth that, in both respects, the principle of causation and of final cause stand upon the same footing. In the application of both to individual cases men are liable to error, and, for similar reasons, from defect of intellect, from hasty observation and narrow generalization, as well as from the moral defects of vanity

indocility, and self-will. In the assumption and belief of these principles they are equally confident as they should be, because both are alike intuitive.

(2.) Our interpretations can neither be tested nor confirmed. § 615. (2.) It may be objected that we have no means of *testing and confirming our inductions* in respect to ends, while in respect of causes and laws we are provided with tests, rules, and methods which are universally acknowledged to be all-sufficient. In ordinary cases the methods of agreement, of difference, and of concomitant variations are acknowledged to be ample: In special exigencies artificial experiments may be instituted to supplement the deficiencies of simple observation: But in ascertaining ends we have no such methods, tests, or experiments.

In reply, we observe that the so-called methods and rules of induction are no self-acting categories or logical machinery which need only to be set in motion to secure infallibility from error, but are simply general maxims which sum up and record the processes which are natural to all men. Man performs inductions as really without as with the conscious use of these rules, thereby showing that he believes in the universal prevalence and discoverableness of causes and laws. So, also, does he search after and discover ends as naturally and readily, which indicates that his belief in design is original and necessary. If it were to be conceded that each are discovered and tested by methods peculiar to themselves, and that those used for the one were more precisely determined than those appropriate to the other, this would not weaken our confidence either in the general intuition, or in our special applications of it.

Not entirely unlike in their operation or phenomena.

We are not, however, forced to this concession. It will be found on closer inspection, that the methods appropriate to the two are more nearly alike than would be at first imagined. It has been already shown, § 605, that the end or purpose in its relations to the means of its realization, may be conceived of as an efficient force carried back from the end to the beginning of the series of causes and effects, which drives them to their issue by a constant energy. If this be so, then the determination of the question, What is the particular end of a combination or series? may be ascertained by the methods appropriate to an efficient cause, the end being conceived as acting like such a cause. It may be less easy in some cases to suggest or devise the probable end than it is to conjecture the probable cause, inasmuch as many such ends might be supposed in a given case as equally compatible with the effects. But, on the other hand, it may be urged that in other departments of nature, as the *organic* and *historical*, the ends and adaptations are so obvious as to flash upon the mind without the need of inquiry or tests of any kind, while in these very departments the efficient forces are so withdrawn as to elude the most subtle analysis, and to refuse to yield to the most exact and rigorous methods.

Nor should we for a moment forget that these very methods of induction rest on the assumption of this same adaptation to rational ends in the constitution of nature, for which we claim the priority and authority of a principle intuitively discerned.

3.) This relation derived from conscious experience.

§ 616. (3.) It may be still further objected that the adaptation of means to ends is a phenomenon, or actual relation, of which we are aware from our own conscious activity, and it is simply by a fiction or imagination that we transfer it to other, i. e., to material objects: If it be granted that we adapt means to ends in our own rational procedures, we are not therefore warranted in affirming that a similar procedure is to be assumed of the entire universe.

The same is true of that of efficient causation.

To this objection we reply, that the activity of our own minds and the relations which are instanced or exemplified in them, hold precisely the same relation to efficient as to final causes. The most complete knowledge, we may say the only complete knowledge, which we have of power or efficiency, is gained through or by means of the active energy of our own spirits. By this, we in a certain sense image, cf. § 597. this abstract relation whenever we have occasion to affirm it of impersonal or material agents. In doing so we use examples, associations, and language taken from our personal activity. But we do not thereby in thought attach to a material agent the properties of personal will, such as usually attend the exertion of spiritual force in the direction of the thoughts and movements of the body.

Still less is it true that we affirm this relation of all the objects in the universe, because we have happened to have experience of its agency in our own spirits. We assume, i. e., intuitively affirm it as necessary to a rational construction of the universe. In the same way we assume that an adaptation such as that by which we consciously control all the higher activities of our nature and the results of which we impress upon and manifest in the material structures which we contrive, holds good of the causal arrangements of the universe, both material and spiritual, and is employed to explain its constitution and its phenomena.

Not unphilosophical to transfer it from consciousness.

But the objection itself suggests an argument in defence of the propriety of making this very application of final cause. The power of adapting means to ends is one with which we ourselves are very familiar in our own conscious experience. We propose ends. We devise and arrange, i. e., adapt means to bring them to pass. We interpret the actions of others by supposing that they are directed by such intentions and adaptations. We interpret the results of their actions when fixed and made permanent in structures wrought by the same relation. No one denies that the relation exists in portions of the universe, i. e., in the activities and energies of the human soul; or that it is proper to apply it to the explication of those creations which are known to proceed from the human intellect. By this we solve or explain every machine which is submitted to our inspection. We assume that every thing that is made by man is constructed for some end. When we study it, we do not merely seek to understand the parts of which it is composed in their capacities and laws of working, but we seek to trace out the ends for which they are combined, and the various adaptations of which they are capable; tracing out not merely their capacity to accomplish certain ends in a certain manner, but to accomplish desirable ends in the best manner.

The relation unquestioned in some applications.

It is a fair *argumentum ad hominem* to say, that here is a known agent or power in the universe which acts in a given way. The agency is spiritual, which first proposes ends and then adapts forces for their achievement. It is certainly possible or sup

possible that the results of a similar agency should pervade the universe, making themselves manifest in a discoverable adaptation. To assume or employ it in the explanation of phenomena is not unphilosophical.

J. S. Mill well observes in his *Logic*, B. III. c. xiv. § 7: "There is a great difference between inventing laws of nature to account for classes of phenomena and merely endeavoring in conformity with known laws to conjecture what collocations, now gone by, may have given birth to individual facts still in existence. The latter is the strictly legitimate operation of inferring from an observed effect the existence in time past of a cause similar to that by which we know it to be produced in all cases in which we have had actual experience of its origin." The application of this principle to our line of argument is obvious. There is a known relation resulting from a well-known kind of action. It prevails by the concession of all on a limited scale, viz., as far as the effects and products of human adaptation are found. To suppose the presence of a similar relation on a wider scale and as explaining a great variety of phenomena, in short, to assume that it is one of the two great relations which hold good of the universe, is by this criterion of Mill not unphilosophical. The relation is known to exist, just as that of causation is known to exist. It is not unphilosophical to assume that it may have as wide an application.

(4.) Two principles introduced into philosophy which may possibly conflict.

§ 617. (4.) It may be objected still further, that if we recognize final cause as a principle, we introduce into the universe, for the explication of its phenomena, two principles, of which the one may possibly conflict with the other. In so doing we weaken confidence in the processes and axioms of pure science, and in the stability of the laws and the order of nature. Science, it is contended, must assume not only the stability but the supremacy of its own laws, and it can neither recognize nor respect any other.

It may be urged in reply that the principle of final cause, is so far from weakening our practical confidence in the stability of the laws of nature or disturbing our faith in the axioms of science, that it confirms both. What science blindly assumes, this rationally accounts for and makes necessary. It gives a reason for the order of nature and the principles of knowledge, and the only reason which can be suggested, viz. the adaptation of such order to the uses and ends of the human intellect, and of human science. As we have shown already, it furnishes the only solid foundation for the assumptions of induction.

Final causes claim the precedence.

But it will still be objected; if efficient causes and physical laws are to acknowledge themselves indebted to final causes that they may command our confidence, then they must also confess their subjection to the same, and be ready to stand aside and be suspended whenever the principle of final cause shall require. In other words, the order of nature may be broken whenever the principle of final cause shall require; whenever the claims of the so-called reason of things, or of alleged moral and religious interests may demand an inroad upon its regularity, either in special acts of creation or exertions of miraculous agency. This we assent to, but, we find no reason on this account to reject the principle or its asserted supremacy, but an additional reason for asserting both. If the principle of final cause will not only render the service of sustaining our confidence in the stability of the laws of nature in all ordinary circumstances, but will also account for such extraordinary

deviations from this order as may be required in the history of man, it deserves for this double service to be esteemed of greater value and authority. [Cf. Locke, *Essay*, B. iv. c. xvi. § 18.]

(5.) The search after final causes has hindered discovery.

§ 618. (5.) It is objected still further, that the search after final causes has seriously hindered the advancement of science, by turning aside the attention and interest of observers from their appropriate duty, which is the investigation and determination of efficient causes and their laws.

Lord Bacon, it is said, was so alive to its evil influence as to utter his memorable and oft-repeated caution in the words: "Causarum finalium inquisitio sterilis est et tanquam virgo Deo consecrata nihil parit."—*De Aug. Scient.*, III. 4. Descartes was still more strenuous in the same opinion, as appears from these assertions: "Totum illud causarum genus quod a fine peti solet in rebus physicis nullum usum habere existimo; non enim absque temeritate me puto posse investigare fines Dei."—*Meth.*, iv. 20. "Ita denique nullas unquam rationes circa res naturales a fine quam Deus aut natura in his faciendis sibi proposuit discernimus, quia non tantum non debemus nobis arrogare ut ejus consiliorum nos esse participes putemus."—*Princ. Phil.*, p. I. 28.

Real meaning of Bacon.

To this objection we reply: That what Bacon intended was that the attention of the inquirer should not be diverted from the investigation of efficient causes by the suggestion of ends or adaptations, for the appropriate sphere of the interpreter of nature is to develop agents and laws that are unknown, or newly to confirm and exemplify those already established. In this he was right. A more complete exhibition of the

mutual relations of the two would have required him to assert that it is only by ascertaining efficient causes that we can reach final causes, inasmuch as we assume powers and laws of nature as the means by which, and the conditions under which, these ends are to be attained. The more we know of the variety and reach of the resources of nature, the wider is our acquaintance with the variety of her ends, the skill of the mutual adaptation of the two, and the economy and sagacity of her workings. That Bacon himself believed that nature is penetrated and illumined by the higher relations of design is evident from this among similar intimations: "I had rather believe all the fables in the Legend and the Talmud and the Alcoran, than that this universal frame is without a mind." * * "For while the mind of man looketh upon second causes scattered, it may sometimes rest in them and go no further; but when it beholdeth the chain of them, confederate and linked together, it must needs fly to Providence and the Deity."—*Essays*, xvi.

It is fruitful of scientific progress.

When Bacon says that the inquiry after final causes is without fruit, he must mean 'practical fruit,' or the production of direct advantage to the interests of man. It is, in fact, so far

from being barren, as to be most fruitful of important results in the way of discovery, and to contribute indirectly, in this way, to the extension of man's dominion over nature, and the advancement of his comfort and well-being. We have already seen, § 610, that the consideration of ends may be fruitful in the suggestion of undiscovered agencies as their means, and in many cases, has actually been a most important agent in such discovery. It is always efficient in leading to the *prudens questio*, the *sagacious guess*, or the *ingenious hypothesis*, which, as the sacred herald, has so often opened the way for the more prosaic and practical train of decisive experiments. If our doctrine is correct, that the methods and rules of induction themselves rest upon the belief in design, then final cause is so far from being barren that she deserves to be honored as the *Alma Mater* of the *Inductive Philosophy* itself.

(6.) The adaptations of nature are only the conditions of existence

§ 619. (6.) It is objected again, that what are called the adaptations of nature, are only the necessary conditions of existence and its phenomena.

When, for example, the eye is said to be adapted to the light, and both to the production of vision, this says the objector, is only another phrase for saying that the eye as we find it, acting with the light as we find it, produces the pictures upon the retina, and these acting with the intellect and sentient organism, produce the sense-perceptions which we call vision. What are called the ends of nature, to which her forces are said to be adapted, are simply the effects of which these forces are the necessary and actual conditions, which we transfer in thought to a period before the activity which we presume they were fitted and arranged to accomplish. The fish, we say, is adapted in its structure and its instincts to the water, and the water was prepared with relation to the fish, but there could be no fish without the water, for without this, the existence and conception of the fish are impossible.

'We know only what appears, i. e., what is made manifest, and we know it under the single relation of the forces which cause it to be. This is the only relation under which we can regard it. As to whether other effects might or might not have been produced from these causes in different conjunctions and intensities, we have no means of deciding. Whether other effects may not be produced in future we cannot say. All that we know is what *has been*, and *now is*, and by what means. These *have been*, and *are*, and occur under the condition of these very causes and laws. To say that these conditions are also adapted to these effects as ends, is to superinduce a relation which is not required for the explanation of the facts. The interpretation of actual effects as adapted or intended or as ends is a mere fiction of the imagination.'

"I take good care," says *Geoffroy St. Hilaire*, "not to ascribe any intention to God, for I distrust the feeble powers of my reason. I observe facts merely and go no farther. I only pretend to the character of the historian of what is. I cannot make nature an intelligent being who does nothing in vain, who acts by the shortest mode, who does all for the best."—*Phil. Zool.* p. 10. To the same purport says *Auguste Comte*, "Si les philosophes qui de nos jours tiennent encore à la doctrine des causes finales n'étaient point ordinairement dépourvus d'une véritable instruction scientifique un peu approfondie ils n'auraient pas manqué," etc.—*Phil. Pos.*, II. 38. "Toutes fois les irrationnels partisans des causes finales s'efforçaient vainement d'appliquer une telle considération à la justification philosophique de leur absurde optimisme."—IV. 638.

It is manifest that these views coincide precisely with those of the old Epicureans, who conceived the universe with its living beings as the result of blind forces, in respect to the action of which we could not say what might yet come or how long the present forces might continue.

A special application has been made of this dictum to the doctrine of the nature and production of species in animal and vegetable life, by Dr. Darwin, in his work on the Origin of Species. This writer teaches that the so-called species in nature are the accidental, but not intended, consequents of certain combinations which gave predominance to certain conspicuous attributes or properties, which were again strengthened by other combinations till they were fixed into permanent races by the conspiring action of the same forces under which they gradually assumed their present forms. In the processes of animal generation and vegetable growth multitudes of other possible species have been evolved, but the laws of life were not friendly to their continuance, or to the development and action of their peculiar properties, and so they perished. The stronger individuals conquered the weaker, and thus, under the law of natural selection, the forms of being now called species, both animal and vegetable, exist and occupy the earth; an equilibrium having been at last attained after an indefinitely long period of strife, of action and counteraction, of balancing and final adjustment. For a statement of this theory in earlier times see *Lucretius*, *de Nat. rerum*, v. 837, sqq., and for a reply, *Cicero*, *de Nat. deor.* 37.

Reply. The truth is *a priori*, not derived from experience.

§ 620. In reply to this class of objections, we need only say that they apply, not to the position that the belief in final cause is a first principle, but to the doctrine that this belief is derived from observation and required by experience. If the principle is intuitive and *a priori* (in the sense explained, § 521), we bring it with us to the explanation of the facts. We do not derive it from experience by an *a posteriori* method, but we apply it to experience by one relatively *a priori*. It is true, if facts and phenomena were inconsistent with the principle, we should be embarrassed by the discrepancy of the two. But no incompatibility is urged, but only that final causes are not proved by experience. It is conceded that the explanation by efficient causes is not inconsistent with that by final causes, inasmuch as it is through effects actually produced that we infer they were intended and provided for.

Experience gives us more than the conditions of mere existence.

But we take issue with the position that we find nothing more than the conditions of existence, as we come to the study of nature with the expectation that we shall discover special examples of adaptation. We find not merely the conditions of mere existence in the causes of effects produced, but the conditions of well-being, or adaptations to a highly artificial, elevated, and refined existence and enjoyment; and these in forms so manifold as to be entirely consistent with the *a priori* principle which we bring to the explanation of the facts. The proof of this assertion can only be gathered from the study of individual examples.

The most striking of these are found in the study of living organisms. We discover in the eye not merely the conditions of sight, but of perfect, unembarrassed vision, as in the dark pigment with which the inner chamber is coated to prevent the disturbing influence of reflected rays upon the picture within. We notice also the closing or opening of the iris according to the intensity of the stimulating light, as it contracts and withdraws this delicate fringe to suit its occasions. We observe also the power of self-adjustment with which the retina itself is endowed so as to act as a movable screen which goes back and forward to and from the lenses that refract the light, and the more wonderful pliancy with which the form of each is flattened or rounded according to the distance of the object. We see in those animals which require a long vertical range of vision and in those which require a range that is horizontal a corresponding shape of the pupil and opening through it. We find, moreover, in some animals, as the horse, an ingenious, self-acting arrangement for wiping and cleansing the eye. In all these facts we find not merely the conditions of certain forms of being, but instances of adaptation to certain forms of well-being.

(7.) Adaptation is limited to organic existence.

§ 621. (7.) It may be objected again: that adaptation can only be traced in fact in a limited class of phenomena, viz., those of organized existence, whereas were it a first truth it might be discerned in all kinds of being, the inorganic as truly as the organic.

It is sufficient to reply that examples can be found in every kind of object-matter as will be shown in another place. They are more striking

within the region and sphere of life, indeed, but are not less real beyond that sphere. Besides, this axiom is the foundation on which rests the structure of the inductive method, which is as often applied to inorganic as to organic being—to the dispositions and relations of the great masses which make up the structure of the universe as truly as to the inner relations which unite the parts of a living being. This makes necessary its application to every kind and style of existence, if this were the only ground.

(8.) We are not warranted in affirming it of all kinds of existence.

§. 622. (8.) It might also be urged that we cannot trace or interpret adaptations on a scale sufficiently extensive to warrant our affirming that they exist throughout the whole universe of being. 'We may, indeed, guess at them within a limited range of observation, but we cannot actually survey the vast spaces which are filled with material and spiritual life, nor can we ever be certain that we have mastered them all in thought. There may be some portion of this universe which design does not control and where adaptations do not exist. It is presumptuous to assume that we can trace the adaptations and discover the ends of the entire universe.'

If all this were admitted, the facts would not hold against the principle that ends exist, and that adaptations to them regulate all the things that are. It is for the principle which we contend, not for infallibility in the application of it to individual cases.

It is with final causes in this respect as it is with efficient causes. That both exist, and both control the universe is known to the human mind by the necessity of its nature. The discovery of instances and examples of each is accomplished by experience and induction. Both can be traced by observation to but few classes of objects, and within that portion of the universe only which comes under our eye or ear, or the report of our fellow-men.

But one can be traced as far as the other. What is connected with its fellow as adapted to an end under this relation, is an efficient agent or force. If we can trace gravitation as far as the utmost verge of material being, we can also affirm that it was designed to hold the masses in their relative positions and their paths of motion. The principle of final cause moreover is absolutely required to warrant the extension of the relations of efficient causes observed within a limited sphere, throughout those regions of which observation and testimony can give only an uncertain and incomplete report.

(9.) Adaptation cannot be affirmed of an unlimited Being.

§ 623. (9.) Last of all it may be said, that the recognition of this as a first principle would require us to ascribe intention and adaptation to an unlimited Being, whereas it supposes certain forces or powers already given or existing, and the problem arises how to dispose of these so as to attain or produce the designed result. Such a problem can never, it is contended, be presented to an unlimited Being, who, by the very supposition, is not shut up to forces or agencies which already exist, but can produce effects by a fiat of crea-

tive will. Moreover, the supposition would introduce into such a mind an order the reverse of the rational. It would make the production of agencies go before the disposition of them to an end. It would make blind force precede wise forecast.

None of these inferences are warranted. Because in the order of design thought must recognize the possible adaptations of forces, it does not follow that the forces must exist in order to be thought of as existing, or in order that certain adaptations should be determined. Both, indeed, may be objects of design, the existence of the forces *and* their adaptations; or rather, the existence of the forces because of their adaptations to accomplish some end of thought. Even the human mind, impotent as it is to create, sometimes imagines to itself, i. e., creates in thought some new agent in the world of matter or of spirit, and revels in contriving the variety of uses to which it might make it subservient. How much more readily may that Being whose thoughts can in any instant become powers, laws, and facts!

This principle is illustrated and confirmed by its applications.

§ 624. But the most instructive view which we can take of this principle is to contemplate the *variety of its applications*. Truths purely metaphysical, especially First or Intuitional Truths, are never apprehended in actual being as general propositions. They can only be discerned in the concrete, as they actually connect individual things or phenomena. Thus, we cannot discern causation or adaptation as *universal à priori*; we only discern an event or being as causative or caused, as a means or an end. When we appeal to the use which is made of these relations in the sciences as proof that they are fundamental and intuitive, we expect to find that these sciences constantly assume these relations to be valid, by connecting their objects by means of them. The constant repetition of this relation and the important uses to which it is applied add incidental strength to the positive arguments for its being an intuition of the intellect.

It is applied in metaphysical science itself.

§ 625. 1. The first application which we notice is that which is made by metaphysical science itself. We have already insisted on its importance in sustaining sundry metaphysical axioms of Induction. § 487. Upon this we need not dwell.

Its application in the formation and arrangement of those general conceptions which are at once the materials and the conditions of all science, is of equal consequence, though perhaps not equally obvious.

(a.) The principle of final cause regulates the formation of concepts.

In the formation of concepts.

By abstraction or analysis we separate the qualities or attributes of existing beings, and by synthesis we unite them so as to form concepts representing real and fictitious objects. We define these concepts by enumerating the constituent elements which make up the essence of each. For example, chalk as a concept, is defined as white, with a certain feel, etc., etc., or, scientifically defined, it is a carbonic acid united with lime. The formula representing any concept and its constituents

is $A = a + b + c + d$, etc., etc. But we are not at liberty to select any attributes which analysis gives us and to unite them into any complex notion which they might form. Some are adapted by logical compatibility to be conjoined, while others are not so fitted. If we search into the grounds of the rules or axioms which regulate this logical compatibility we shall find that they rest upon the assumption that nature has designed that things or beings to which we apply our concepts should permanently continue, giving meaning to the law of identity; that they should be distinguished, giving the law of contradiction; and that they should be generalized, giving the law of the excluded middle. Again: we assume that nature has fitted these objects to be known in their actual relations. This leads us to infer that the laws of thought really represent the relations of things.

But again: not all the attributes which are logically compatible are, in fact, united in concepts by any earnest thinker. The centaur, the mermaid, the hippogriff are logically possible, but not actually. Why? Because the properties or attributes which constitute them are not adapted to exist together in the same being, and, of course, except for the service of the fancy, are never combined. The mouth of man could not receive the food fitted for the stomach of the horse, and the body of a man could not be carried "full high advanced" upon the shoulders and body of the same animal. There is something in these properties, or in what they represent, which fits them to coexist, or they cannot with any reason be combined in a concept which connects the rational and real; which represents things as actual or possible, or contemplates them as ends under existing powers or laws.

In the system-
ization of con-
cepts.

§ 626. (b.) The same principle must be assumed in the arrangement of a system of concepts as genera and species.

It is evident, that as we might make as many concepts as the varied aggregations of single attributes would allow, so these might be arranged into as many genera and species as the similar rule of permutation and combination would permit. Any one attribute might be taken as generic without regard to its actual extent in nature; with this any other might be combined as a *differentia* without regard to the compatibility of the two as provided by the adaptations of nature's laws. It is contended by some, that in the classifications which we actually make, we are guided by mere convenience, that we can make any attribute generic which we please, provided it be more extensive than its *differentia* in its actual prevalence, but that there are no such things as real *genera* and *species*; the concepts having no meaning in such an application. Now if we assume that there are no affinities or adaptations in properties and laws, no ends to which the powers of nature are adapted, and which are designed to be permanent, this view is correct. But the moment we assume that such adaptations exist, and that they can be discovered, as well as the ends which they subserve, then the belief in permanent classes is justified and explained. Every class of beings which are grouped by relations and affinities that involve some obvious adaptations of a permanent character, and imply obvious ends with respect to known powers and forces, or even with respect to the mind's sense of order, beauty, or perfection, is pronounced a real class, as distinguished from those chance and fantastic groupings which indicate neither.

It is notorious, that in the lower and inorganic structures, the physical agencies and laws are the most obvious, while in the regions of organic existence, the higher we ascend, we discern more and more of the relations of adaptation. This explains why it is difficult for naturalists to find the so-called real genera and species in the mineral kingdom; why it is more difficult to determine the species of plants than the species of animals, and why among animals the species of the higher are more easily determined than are those of the lower.

In the definition
of an individual.

§ 627. (c.) This relation is essential to an intelligible conception and definition of an individual.

The term individual can scarcely be defined by physical or mathematical relations alone. One individual atom may, indeed, be distinguished from another by the place it occupies at any moment of time, by the forces it exerts, and the laws which it obeys. But another atom, occupying the same space at the same time, exerting the same force, and obeying the same laws, could, so far as every one of these properties are concerned, be substituted for this. Any one of the myriads of millions of molecules might take the place of any other. But if each is considered as having some destiny to fulfil, some end to which it is adapted, that end defines its individuality. It may not be necessary to assert that each separate atom is unlike every other, and so is a distinct *monad*; according to the doctrine of Leibnitz that no two monads can be exactly alike. It may be sufficient to hold, that no other can take its place in connection with every other without defeating the ends of creation, for then each atom attains relations which distinguish it as a separate individual. Much more does every mass of inorganic matter, whether it is piled into a heap, concentered into a rock, or poured forth as water. Still more strikingly does every crystal, by seeming to strive towards a special form establish itself as an individual. In a higher sense is every plant an individual, as it gathers in from the earth, the air, and water, all which it requires for the end for which it strives in growth, development, and reproduction. The animal is seen to be an individual more emphatically, as it is furnished with instincts that prompt it to those activities which have for their end its preservation and well-being, as well as that intelligent capacity, which in many species, as the fox, the dog, the rat, and the elephant, recognizes the fitness of certain actions to a desired purpose. Man is an individual in the highest sense, because he can distinctly propose to himself the end of his being and actions through the prudence which looks out for private good and the morality which finds its life by losing it in disinterested love; by the science which interprets the universe in its laws and adaptations; and in that religion that mirrors the glory of the Creator whom he worships.

As a criterion of truth and a rule of certitude.

§ 628. (d.) The principle is of the greatest value as a criterion of truth and a rule of certitude. When skepticism suggests that every principle may be questioned, and every observation of fact may be mistaken; that the objective creation may be a shifting phantasmagoria, and the subjective mind but a lying glass of opinion; then the thought of the inconceivable non-adaptation of such a universe to any rational end even of knowledge, restores our confidence in the testimony of the senses, the experiences of consciousness, and the inductions of reason. We try all these by one another, and by the tests which experience and science have discovered, but we *trust* them at last, when they conspire to ends that are worthy of rational order in a universe adapted to be known by a being who is manifestly designed to know, and to confide in his knowledge when properly tried and proved.

Applied in geometrical construction and deduction.

§ 629. 2. In the Mathematics even, the presence of this relation is often recognized.

In pure geometry it may be applied more frequently than would be anticipated. The circle is adapted to prove a great variety of theorems, and to solve many problems, as is manifest in any treatise on geometry. If we are required to construct two triangles on the same base, the angles of which at the apex of each shall be right angles, it can readily be done by describing a half-circle on this line as a diameter, and any number of triangles can at once be drawn so as to fulfil the required

conditions. We discern in a portion of space bounded by a half-circle, the capacity or adaptation, that waited long to be discerned; i. e. the means adapted to an important end.

In a similar way, by a skilful construction of squares, parallelograms, and triangles, it may be demonstrated that the squares on the legs of a right-angled triangle are equal to the square upon its hypothenuse. Indeed, the number of these possible adaptations in the various figures which may be constructed in space to solve and prove problems and theorems, is well-nigh innumerable, as is manifest from the constant progress of geometrical science. The invention of the geometer is constantly tasked in efforts to hit upon the requisite constructions, and to draw the auxiliary lines which are needed to enable him to reach the end which he proposes. The relations of pure number open as wide a field of inherent fitnesses to serve the ends of the student. It is upon the faith that additional adaptations remain to be discovered, that the mathematician prosecutes his inventive work of discovery.

In applied geometry.

The adaptations of the mathematics to the service of physics are if possible still more striking. No projectile was ever thrown in an exact parabola but the theory of this curve is adapted to explain the direction and motion of every body that is launched into the atmosphere. The theory of the lines in which bodies tend to move, and the rates in which bodies, when impelled, move in fact, is adapted to regulate the mechanics of bodies as they fall to the earth, and the motions of the orbs which revolve in the heavens. It also explains the phenomena of the pressure of fluids. The relations of number solve the mystery of chemical combinations, and explain the symmetry of agreeable forms and the harmony of musical sounds. They enable us to discern a common law in the arrangement of the leaves upon the stem of every tree, and in the placing of the planets along the lines which stretch out from the sun.

In applied numbers.

On the first thought, it would seem that in extension and number it would be impossible to find so great a variety of possible adaptations. But on reflection, we find that their capacity of multiform application is the only key to the perfection of the sciences of matter and the reduction of its forces to unvarying laws.

We have urged that the belief in final cause must be intuitive, because we could not otherwise confide in the axioms of induction. But we see in the provision for the possibility of mathematical science, and of its universal application to material phenomena as the indispensable condition of their laws, another example of design where we had least expected its manifestation, viz. in those time and space relations which render the mathematics possible.

Applied in geology, etc.

§ 630. 3. Geology and Paleontology both assume the truth and applicability of the principle of final cause.

Geology was at first content to explain the formation of the crust of the globe by analyzing its parts into their constituent elements, and recording the order in which the rocks had been compacted and broken down, and the strata had been formed and deposited. In these investigations it proceeded as a science of observation, watching and recording the operations of the forces of nature according to laws already ascertained.

But, aided by paleontology, geology has proposed to itself a higher problem, and contemplated facts under more elevated relations. It has traced a plan and order of development resting on the assumption of a series of ends subordinated to one another, and terminating in

a habitation equally adapted to man's higher and lower nature. It has ventured to recall the successive phases of organic life by reproducing extinct species of plants and animals amid the lakes, marshes and jungles in which they sported and from which they subsisted, and to arrange these phases in the order of time and of a more and more perfect development. The assumption which directed these bold essays and enabled the observer successfully to apply the hints furnished by the facts supplied, is, that an order of fitness and progress has been followed from the first, that each epoch has prepared the way for the next succeeding; the adaptations of each being complete in animals, plants, and scenery. Following the same clue, this science has found in each previous epoch not merely the materials of the one which succeeded, but that each represents a less perfect form of life than that which follows it. This series terminates with man, who represents the highest type of life and shows that he is the end for which all others are designed, by the fact that he alone can comprehend the import of the plan and recognize the relations of the parts to the whole and of the whole to himself.

It is by the intuitive belief that adaptation rules the universe, and the expectation that its special relations may be discovered, that geology has reared its imposing structures, with the aid of here and there a fossil—structures which could never have been reared except for this foundation to support and give order to these materials of fact and experience,—without which assumption they would deserve to be viewed as a day-dream, or a series of brilliant scenes from fairy-land. Geology, by the very aims which it proposes, and the splendid results which it has achieved, gives its tacit yet fervent assent to the original authority of the intuition of final cause.

Applied in philosophical geography

§ 631. 4. Philosophical Geography gives a similar testimony. This science, as conceived and perfected by Ritter, takes the earth where geology leaves it, and shows how each continent and country was fitted for the part which it has played in the world's history, by its structure, surface, soil, and climate, by its mountain-barriers to repel, and its coasts and harbors to invite, by its river-systems to bind remoter portions, or its insular situation to make defence easy. It shows that every part of the earth was not only adapted from the first to receive and develop the race which was allotted to it, and to become the scene of the events which have made it memorable, but to transmit the results of these achievements to neighboring countries and other races, and even to transfer them to remote parts of the earth and a later and better civilization. By referring intellectual and moral influences to favoring physical conditions, it enables us to find an adaptation to important moral results, even in the material arrangements of the earth.

Adapted to comparative anatomy.

§ 632. 5. Comparative Anatomy rests upon the same intuition. It would have no meaning, as it could have no truth without it. It is a science of similar adaptations, not only of organs to functions, but of analogies of form and feature and inner structure to the completeness of a progressive plan, and even to the achievement of an æsthetic effect and the expression of an æsthetic import. It connects the fin of the fish, the arm of the man, and the wing of the bird, not merely by their adaptations to similar uses, but by the similar relations which they hold to the skeleton or frame, regarded as framed after an ideal type. It arranges all living beings in order, as each is adapted to a place in the series or system, by the greater or less perfection of its structure or development. It discovers that man himself goes through each step in the series, and represents in his progress the history and order of that whole which he both crowns and

completes, and in which, with reflective interpretation, he himself reads the arrangements of a rational Artist.

Give this science a bone, and it will draw or model the animal, tell you how large he was, how formed, on what he lived, what were his habits and disposition, what the length of his life,—and all because it reads the adaptations that gather and cluster around this fragment of the skeleton, which except as thus interpreted were only a broken and abraded fossil.

Applied to physiology. In the animal structure generally.

§ 633. 6. In Physiology, special and general, similar relations are more numerous and manifest. The departments of animal and vegetable life abound, or rather overflow with examples of fitness and adjustment. The nicer the analysis of elements and of organs, and the more subtle the detection of offices and functions, so much the more exquisite are the discerned relations of adaptation of each to each. Not only is there seen a fitness of one organ to another, as of the lungs to the heart, and to the common end of all, but there is a fitness of every organ to the element in and by which it acts, as of the lungs to the air and of the eye to the light. The more we learn of the structure of the one and of the properties of the other, the nicer are the adaptations which we discern between the two.

In its adaptation to the disposition and functions of the animal.

The adaptations of the organs to the disposition and destiny of the animal, are, if possible, still more interesting. In this case, the end to which the structure of the bodily organs is adjusted, is as yet non-existent, and the uses to which it is to be applied are not apparent till the animal has passed several stages of development, and perhaps has assumed two or three lower forms of being. If we examine the eye of the hawk, the owl, the cat, and the mole, we find that in them all, the form of the pupil, the capacity for contraction and enlargement, the length and the range of vision, as well as the power of the optic nerve, are all specially adjusted with reference to the prey which each is destined to seek, and to the methods and facilities by which it must secure it. These again are adapted to the impulses and dispositions of the animals, so far as these prompt them to the special acts to which the eyes are adjusted. Some animals exist in two or three forms of being, as the caterpillar, the chrysalis, and the butterfly; and it is noticed that with the sphere of existence belonging to each, there is a similar adaptation of every part of the inmost structure to the still more interior disposition and instincts. So that in the being who begins to be, there are present not merely existing endowments fitted to one another and the sphere of their activity, but undeveloped capacities in the same variety and completeness, of their fitness to a sphere and to functions as yet undeveloped and not even conjectured by man.

In protection against injury and exposure.

In the animal frame there is protection against the injury of any portion to which the structure or habits of life open any special exposure. Thus the brain is defended by the thickness and form of the skull, from violent blows, and from jar or concussion by a series of elastic cartilages;—thus also the substance of several organs is specially insensible because exposed to specially trying usage. The animals who are destined to fight and to live in special danger, are furnished not only with weapons of attack, but with an armor of defence, or if armor is not provided them, swiftness and dexterity are supplied in its place.

The adaptations of the frame of man to the functions and uses of the rational soul, are still more striking; but we here approach, if we do not cross, the line which divides physiology from *Anthropology*.

Applied in anthropology.

§ 634. 7. In Anthropology we trace these higher adaptations.

The human hand does not differ more strikingly from the hand of the monkey than the mind of the monkey from the mind of man. The mind of man has endeavored to discover and combine the powers of nature, and to devise the appliances of art. Whatever the mind has prompted the hand to construct, the hand has been able to frame, either through the seemingly exhaustless versatility of its flexible organism, or by the tools and machinery with which it has contrived to supplement its powers. So wonderful has been this service, that it has been questioned, whether the human intellect or the human hand has been the most conspicuous in shaping human destiny and in developing human history. The hand has also by the economy of nature been fitted to be the medium of conveying varied intellectual and emotional expression to the intellect and heart, which have been as mysteriously fitted to receive and interpret its indications. The hand invites and repels, commands and forbids, soothes and enrages. It appeases with its gentle waving, and smites with ferocious energy. It adores with the uplifted arm, it blesses with the outspread palm; it blasphemes with aimless and impotent motions, and curses with its downward stroke.

I. the provisions for and the capacities of language.

But there is no adaptation of the mind and body that gives to both united an interest which at once so fascinates and baffles our prying scrutiny, as that exhibited in the agency of both in the production, use, and development of language. There are two conditions of language, the bodily and the mental.

The bodily are also two, the mouth and the ear, to which the hand and the eye are accessory. If the vocal organs are imperfect or lamed, there can be no speech. If the ear is closed or disabled, the speech cannot be received, and there can be no language. But the mind must also furnish its material through its required capacities and development. Language is impossible until the mind observes and generalizes and affirms. In other words, the mind must first think the material and spiritual universe with which it comes in contact into the thought-world which its powers and laws fit it to create, before it can give to it expression by language. There must also be awakened the impulse to speak, and with it there must be called into action the capacity to speak. Man does not invent language under the strong desire to communicate, any more than he invents walking under the desire to go from one place to another. He finds himself walking under an adaptation of his limbs which is manifested by their actual use, which use is also perfected and trained. In the same way he finds himself talking, i. e., using bodily sounds to express and impart thoughts and feelings, under an impulse and by an adaptation of the body to the soul which is more striking. This adaptation of the vocal and the spiritual to each other, and of the possible elaboration of the one to the possible refinement of the other, quite go beyond the observed fitness of the eye to the light, or of the ear to the agent of sound. The materials adjusted to one another are in their nature most diverse, being parted by the wide chasm which seems to divide matter and spirit; and yet in the functions of matter as organized for speech, there are dormant capacities for the service of the as yet undeveloped attainments of spirit. These relations do not exhaust all the adaptations which are brought to light by the unfolding of language. Not only are these two parts of the complex body and soul fitted to expand side by side with one another, but the expression of thought in language reacts with wondrous energy on the development and refinement of thought itself, so that it is not only true that the developed thought finds itself able to employ language in its service, but it is also true •

that the thought in order to be developed, must express itself in language. Man not only speaks because he thinks, but he speaks that he may think, i. e., think with clearness, precision and progress. The two are not merely so adapted that the one can expand side by side with the other, but it is difficult to say which is the most dependent on the other.

There is another class of adaptations which here present themselves. Man is fitted for society, and in society only finds his natural sphere. But society is possible only through language. The complicated and refined adjustments of matter and spirit which find their proximate end in language, reach still further in their remoter adaptations to man's social existence and well-being.

The celebrated Galen says, in his treatise concerning the human body, that by the variety and accordant action of its adjustments, it seems to utter an anthem of praise to its maker. But the philosopher who reflects on the mystery of human language, in the subtlety of the elements involved, the variety of the conjunctions, the delicacy of the structure, and its capacity for growth and development; especially if he watches the feeble beginnings of such splendid promise in the lisping of infancy, would find a new meaning in the familiar words "Out of the mouth of babes and sucklings thou hast perfected praise."

§ 635. 8. In Psychology the occasions for final cause are more frequent and pressing than in either physiology or anthropology. The human soul is one, and hence in certain aspects and relations it must be viewed as a single force. But its modes of action are various, as are also the conditions of its activity, giving products that are distinguished in consciousness. They are also discerned as similar in their properties, in the occasions of their production and the laws of their activity. In this way, we apply the relation of efficient causation to explain the phenomena and faculties of the soul.

But it is often difficult for consciousness to analyze the operations and products that are so closely entwined in our experience, and to trace each product back to the separate germ from which it springs into life. The adaptations of these operations and products to one another, and to the manifest ends of the soul's culture and well-being are, however, often so obvious and remarkable, that they frequently settle questions that would otherwise remain unsolved. For example, in considering the acquired perceptions, it is noticed that animals possess from the beginning, a capacity of judging of distance and size which man is forced to acquire by slow and painful effort. It is questioned whether our observations in respect to this point can be trusted, whether there is not some error or oversight in the analysis of the phenomena. The consideration of the end to be accomplished by this apparently abnormal arrangement relieves the difficulty. Man, we observe, needs the discipline required by the slow process of acquiring what the animal knows (after the animal fashion of knowing) at the beginning. The consideration of adaptation removes the similar difficulties suggested by the question, 'why the range of instinct is so much wider and more unerring in the lower animals than it is in man, the highest of all?' We assent to the truth, that the destiny and ends of the two

Relations of language to society.

Application to psychology.

Of special importance in this science.

are so diverse that we may reasonably accept the evidence which observation furnishes.

Explains the differing periods of development. We notice that the powers of observation, the so-called objective powers, are developed at a period and with an energy and effect which are strikingly contrasted with the slow and feeble unfolding of the rational and reflective. How

this should be, we cannot so easily answer; i. e., according to what law of efficient causation. There is no antecedent necessity in any power or law of nature or spirit, that requires such an order of development. But *why*, or for what end it is so, can be understood if we consider the purposes that are to be accomplished by furnishing the intellect largely with materials before it is called to elaborate them, and by letting loose the soul in the freedom of spontaneous activity before it is schooled to the painful processes of reflective thought. The ends accomplished are not intellectual only. Those which respect man's social condition and his emotional and moral culture, should also be considered, and these are ever forcing themselves upon our attention.

Explains why the rational faculty is supreme. Above all, psychology acquaints us with the rational faculty as that pre-eminent power which proposes ends and devises means for their accomplishment. It acknowledges that this is the highest of the intellectual powers, that it is lawfully supreme, that in the service of this power we investigate causes and determine laws in order that we may attain some end or direct the result to some noble or useful application. In the subjection and adaptation of the lower to this highest power it finds confirmation of the propriety of assuming the relation of adaptation in all our interpretations of nature. If "on the earth there is nothing great but man, and in man, there is nothing great but mind," it is emphatically true that in the mind there is nothing great but the reason which proposes and discovers ends, and is itself an end to the lower actings of the intellect.

Applied and assumed in ethics. § 636. (9.) Ethics, the science of duty, which is so closely allied to, if it is not a department of psychology, is founded entirely upon the intuition in question. Indeed, that ethics should be made a science, it is necessary to assume that the relation of adaptation is intuitively known. Its subject matter is derived from the ends of human existence and human activity. The comprehensive and fundamental question which it asks, is, for what kind of action is the human soul adapted by its constitution, and what must man be and do to fulfil this end? Whatever be the language in which this question is phrased, and whatever the answer which it receives, it rests on the single assumption that man is fitted for one kind of action rather than for another, and that the action for which he is fitted is right, while the action for which he is not fitted is wrong. It asks, how shall these adaptations be discerned? By what faculty or capacity, one or more, are they discerned and responded to? What are the tests or criteria by which they are distinguished? What external actions or duties must we perform in order most effectually to fulfil these ends?

Corresponding to the power of apprehending duty, is the faculty of

will or choice qualifying man to fulfil the end of his being. The existence of this power, its importance to human development and responsibility, the necessity that it should be defended in its integrity, explain the necessity of moral trial, and the possibility of moral evil; under the one relation of the ends which the possession of this power and the exposures which it involves are adapted to fulfil.

The adaptations with which ethics has to do, are chiefly internal, and suppose a spiritual organism in the soul—a system of internal adaptations in the several powers with which it is endowed, which indicate our duties and our obligations. These all exist for moral perfection. To this the soul is adapted and to it it tends and is impelled. Without this intuition and faith in its truth, ethics can have no meaning and duty no authority. If reason as proposing ends is the highest ruling power in man, then the reason, when it discovers and proposes the highest moral ends, exercises its loftiest function, and reigns sovereign over the inner and outer world by a self-justified authority.

§ 637. 10. In Theology, or the science of God, whether natural or revealed, this principle is of supreme importance. The most of the so-called demonstrations of the being of God, find their material or grounds of proof in the indications of design that are furnished in the material and spiritual universe.

These arguments are usually stated somewhat thus: Design proves or implies a designer; The universe abounds in design; Therefore the universe implies or proves a designer. Or, order and adaptation imply a designer; The universe abounds in order and adaptation; Therefore a designer exists.

The major premise in this argument is obviously assumed or received as *a priori*. The minor is a statement of fact grounded on observation or induction. Those who employ it would not accept the view for which we contend, that the belief that adaptation prevails throughout the universe is a first truth or axiom of thought. They rest their belief upon observation, and they search through the universe to discover instances of the presence of this relation. Having observed a sufficient number, they gather them into a result by induction, and then apply the proposition which expresses them as the minor premise of their syllogism.

We have sought to prove that the proposition affirming final cause is a first principle or intuitive truth; that it is not in any sense dependent on observation, but is an original and necessary belief or category; that so far from being derived from induction, it is the necessary ground on which induction itself must rest for its validity and application.

It is an interesting question, How does this doctrine stand related to the knowledge of God and the belief in his existence and attributes? We find in point of fact, that it has opened the way for speculative inquiry which has resulted in a great variety of diverse opinions.

§ 638. These diversities of opinion may all be grouped in two leading classes or divisions, according as the adherents of each reject or accept the belief of a personal God. The one class believe in design as an immanent force, which does not involve a relation to any thing beyond the object itself. They fully accept the truth that design rules throughout nature. They find examples of the relation of final cause everywhere present. But they insist that these

The adaptations
chiefly psychi-
cal.

Application to
theology.

Argument for
the Divine exist-
ence in its usual
form.

Two classes of
opinions in re-
spect to the Di-
vine existence.
The first rejects
personality.

do not necessarily carry the thoughts out of nature. Final cause or design is a force in nature itself, being *immanent* in each separate object, or in all existing objects, taken as an organism or whole of parts mutually related and connected.

For example: the vine growing in the dark corner of a cellar, follows after the light by a tendency toward the condition of its well-being, in obedience to whose impulses it acts under the law of design which is within the vine itself. In a similar way the vital force organizes the animal structure, anticipating by an immanent adaptation in the form, material, and functional capacity of each organ, the end which it actually reaches in the fully developed individual by itself and in the individual as related to the species. So the bird builds its nest under the same law of immanent adaptation of its tendencies towards the end which the necessities and nature of the bird require. Under the working of the same law, the bee moulds its cell and its comb, and the beaver constructs its dam and its double house. So, under a similar immanent force acting as a law to all its working, has the universe developed itself through its successive phases in the several geologic periods, involving the production of the varied forms of animal and vegetable life till it has reached the end to which it has all the while been tending, viz., the production of self-conscious and rational man, who is an end to himself and nature, and who can interpret the mutual adaptations of both.

Those who hold this doctrine, concede that adaptation prevails in nature, and must be assumed to explain its powers and operations; also, that it works all the while as though a personal mind had contrived these ends and the relations which they involve, and also continued to direct them. But they urge that we are not forced to ascribe this adaptation to a personal being, but may refer it to an impersonal, unconscious, unthinking force, as blind and unintelligent as the efficient forces that act by mechanical laws.

The second accepts a personal God.

§ 639. The second class contend that the necessary correlate to *adaptation* is a designing mind: Adaptation is the objective relation to which thought is an essential supplement:

Adaptation does not prove or indicate design, but it logically implies it: If, therefore, the adaptation is real, so is the designing mind. In assuming the one by an *a priori* necessity, you must also assume the other. The belief in adapted things both logically and really carries with itself the belief in adapting thought and an adaptive thinker. The mind need not necessarily think of the two at the same instant, or in the same connection. The attention may be so concentrated upon the adaptation objectively considered, its ingenuity, the variety of the means employed, the intricacy and order of the combinations required, that it does not in thought refer to the correlate, but this fact does not prove that it is not necessarily involved. For example: in a machine of human devising, an ingenious mind can discern very many adaptations, without adverting to the mind which produced them, or distinctly recognizing the fact that it proceeded from any thought. But as soon as it raises the question and reflects on the relation it believes the fact.

Objections.

It may be said in the way of objection, that when we reflect on the adaptations of nature, we do not, as in the instance of a human machine, refer these adaptations to a thinking mind, but resolve them into many intervening impersonal agencies, and reach the divine mind only by the mind's weariness in

going through an unending series, or its want of philosophic courage in making the series to return upon itself, so as to make the universe a completed cycle—the absolute—an organism of which every part and the whole are mutually end and means.

To this it may be replied, that it is true that the mind does not pass in thought directly to the divine agency, but for the sole reason that it learns by observation and experience that other agencies are interposed involving other adaptations, which widen the range of its thinking and enlarge its conception of the organism itself. It does not refuse to allow the series of successively adapted objects to return upon itself because it lacks the courage to think the absolute, but because the conception of an absolute, consisting of adapted elements without thought or design is irrational, and of course unthinkable and unbelievable. It accepts the conception and the fact of an absolute with all its mystery, but it is an absolute that is completed and made perfect by supplementing objective adaptations by subjective thought.

Intermediate agencies do not disprove personality.

If the mind were not carried from one relation to another of objective fitness, and thus detained and diverted from the necessary correlate, it would proceed directly to the designing mind,—the intelligent originator. Such is the faith of children. This also is the faith of those races of men who have not attained to the knowledge of the general forces and the undeviating laws of nature. Such believe that ingenuity supposes intelligence, and find no difficulty in believing in the direct energy of a superior intelligence, even while they hold to the action of the few second causes which their limited experience of nature has enabled them to generalize. This may be called superstition, it is true, but it is really superstition so far only as it directs its faith to mistaken objects or overlooks the agency of intermediate forces. It is no error to refer adaptations to intelligence, however serious an error it may be to narrow the range of the fitnesses. What makes the superstition plausible and tenacious is the truth that intelligence is required. Not only would one 'rather believe all the fables of the Alcoran,' as Bacon says, but it is more rational to believe them, than that "the universe is without a mind." To exclude or to deny this reference of these designs to such a mind, is the superstition of modern philosophy which so restricts the attention to the efficient causes which render adaptation possible and evident, as to fail to regard them under the higher relation.

An example will illustrate the similarity and the difference between the application of this relation in the case of the savage, who ascribes a single instance of adaptation directly to a rational deiver, and the philosopher in the other, who sees it extend so widely and numerously over an immense field of efficient agencies that he questions whether to ascribe it to a rational spirit at all. We take a plant, say the weed that is trodden under our feet, or the bud that is just starting in the nearest hedge. The plant is itself so abundant in adaptations, that regarding it by itself, we might say it was produced directly by a creating power; but we discover that it was not so created but was evolved from a tiny seed. But the seed, to produce it, must depend upon the light and moisture, upon the sun and the earth, as co-agencies, in order that it may germinate and grow into a perfected plant. The seed in its turn was evolved from another plant, which was also evolved in a similar way and ripened from another plant by the aid of sun and air and earth. What if this is so? Are not the heat and light and moisture as really adapted to the several parts of the plant, as the organs of the plant in their functions are adapted to one another? Are not all an organism, as truly, though not by so close and exclusive a connection, as are the constituents of the plant itself? Is not the whole series of the plants of a single species, with all the agencies which condition their coexistent and continuous life, as truly an organism of mutually adapted elements, as if a single individual of a non-existent species had been created in the morning and had perished at night? The discovery of additional conditions, though they stretch throughout the universe in space, or of efficient forces, though they extend in time through a long series and are connected as parent and offspring, simply renders the structure more complex and its adaptations more various and interesting.

Efficient causation consistent with intermediate agencies.

The knowledge of efficient causes suffers the same enlargement and expansion as the knowledge of final causes. The savage ascribes the effect directly to its proximate efficient and goes no farther. He does not ask, he does not answer, whether this efficient is so related to other causes as to be itself an effect. Or if he soon learns that this is true on a limited scale and within a narrow range, he

does not so extend his thoughts as to grasp the grand agencies of the universe, and see that these operate after definite laws, and together constitute a comprehensive mechanism of mutually related causes and effects. But his belief in the relation is as real as is that of the philosopher notwithstanding that he applies it in a limited or superstitious way. It does not therefore follow that because the savage and the superstitious make a limited application of the principle of final cause the philosopher should not believe that it pervades the universe, and requires as its correlate a designing mind.

The relation of efficient to final cause. § 640. The application of this principle in the service of Natural Theology raises another question; viz., What relation has efficient to final causation in the universe? Does each lead us to its separate principle or agent, or do both united direct us to one? Does the adapting agent simply take the efficient forces and laws of the universe as it finds them, and arranging them as best it may, bring out of them the wisest results to which its sagacity may adapt them, or does it also originate the forces which it arranges and combines? The one view gives the eternity of matter, with its hindrances and limitations and possibilities of evil, making the Deity a Demiurgos or Plastic energy. The other makes the originator and the arranger to be the same power and mind. The one view is the cruder theism of Ancient Philosophy, the other the purer theism of the Jewish and Christian Scriptures.

It would carry us too far from our appropriate theme to argue here the question between the two. The discussion of it belongs to Natural Theology. Psychology suggests the following solution. The purely Theistic theory is supported by the cardinal principle of all philosophizing which bids us provide the fewest agencies which solve a problem or explain a phenomenon. The theory is certainly conceivable, and the analogy of the human soul, which combines in itself—under limits—a creating force and an adapting or designing force, gives the strongest possible testimony in its favor.

CHAPTER VII.

SUBSTANCE AND ATTRIBUTE: MIND AND MATTER.

WE return again to the relation of *Substance and Attribute* and its most important applications in the determination of our definitions of *Mind and Matter* and of *Real and Phenomenal Being*. The Relation itself in the abstract, we have already briefly explained under the *Formal Categories*, § 542. We have also in passing alluded to its applications to the objects of *Sense-perception* and of *Consciousness*, §§§ 165, 6; 96. To do complete justice to it, however, we must first have considered the various classes of relations which are known as attributes of material and psychical beings. The Relation is so fundamental

and so much discussed in Psychology and Philosophy, as imperatively to require a somewhat extended discussion.

Substance distinguished from the logical and grammatical subject.

§ 641. The various import of the concepts denoted by the words should first be explained. The substance or substratum with which we have to do, is the Real substance or substratum, and as such should first of all be carefully distinguished from the *logical substance or subject*. A logical subject is any thing which is conceived in thought as a substance with attributes, whether it does or does not exist in fact. Thus any *abstractum* can be treated in thought and described in language as though it had real being, and were endowed with real attributes. The concepts *power, goodness, responsibility, representation, republic, wages, wealth*, or any other abstract notion, may be conceived in thought and treated in language as having properties or qualities which are affirmed of each as though it were a real being. Any object of thought, whatever it may be, which is made the subject of a mental affirmation or predication, is a logical subject. The attributes of a logical subject are predicated of it in the same forms of language as are the attributes of a real being. The subject itself in all its elements is, however, generalized from a reality, and can only be understood and interpreted by means of such reality and the elements or relations which such a reality involves.

Real substance ought also to be distinguished from the *grammatical subject*. The grammatical subject is any word which is used in a sentence as though it were a logical subject. As a logical subject is one of which attributes or properties are affirmed in thought, so a grammatical subject is one of which attributes are predicated in the forms of language. The grammatical and logical subject, as is well known, may in fact coincide or be separate from one another. Both presuppose the Real or Metaphysical relation of substance and attribute. They are both imitations of it in thought or language, and derive all their meaning and force from this original.

The Etymology of the Terms. First of Substance.

§ 642. The Etymology of the Terms is worth a moment's notice, so far as it may serve to explain any philosophical theories and relieve any philosophical difficulties. The words *substratum, substance, and subject*, have a common derivation which literally imports something *standing or lying under*, and implies that there is something placed above or upon it which may be removed. This suggests the impression that the attributes are superinduced upon the substance, as folds or wrappings are thrown over or around a nucleus or core within. This prompts to the effort to lay off the covering, to separate the wrappings from that which they invest, to scale off the laminæ or folds, and find the naked substance or substratum within or beneath, bare of all qualities and relations. The effort to lay aside the qualities in order to find the subject is soon discovered to be vain. It is as though one should cut down the trees in order to find the forest. It is found to be impossible to discover an actually-existing subject without attributes. The simplest

and barest object in the universe, that which in its nature is the most uninteresting and the most undistinguished—as the *mote* in a sunbeam the minutest perceptible *grain* of *sand*, the *atom* or *molecule* which the physicist cannot perceive, but of which he learnedly discourses, the *monad* of which the metaphysician confidently speculates—must always be conceived as having place and form, and as involving the relations of extension and force. But all these are attributes. The innermost nucleus or core of every material object is still possessed of form and properties, and is just as truly and necessarily a substance as the material object itself. If it is conceived by abstraction as a mental something, it must still occupy a portion of space by its power to attract and repel, *i.e.*, it must still be conceived as substance and quality. If the substance is spiritual, it cannot be conceived except as endowed with certain capacities which constitute and define it.

Etymology of
attribute, quality,
etc.

The *etymology* and *use* of the terms *attribute*, *quality*, *property*, and *accident* do not give us any greater satisfaction as to the nature of the distinction. The term *attribute* simply directs the attention to the fact that we *attribute to*, or *affirm of*, a being, something which we distinguish from itself; but what we distinguish or what it is distinguished from, is in no way explained. *Quality* is a term of classification merely, and signifies the being of a certain sort, without explaining how it comes to be of that sort. *Property* indicates, that what we thus attribute or affirm belongs peculiarly or *properly* to the being or substance, and *accident* that it belongs to it *occasionally*. These different words are only different names for the same conception, as differently used. But their *etymology* or *application* throw no light upon the conception itself, or how it originates, or is distinguished from its correlate *substance*.

We learn moreover that we can no more find an attribute without substance, than we can find a substance without attributes. We cannot separate length from something which is long, nor color from something colored, nor thought from a thinking being, nor joy from a rejoicing being. The two conceptions are never parted in the world of real being. They are not merely correlated by a logical relation, but they are always inseparably conjoined in actual existence.

Obscurity and
diversity of
opinion in re-
gard to the rela-
tion.

§ 643. This analysis may explain why philosophers have found so great difficulty in explaining the relation in question, and have been so dissatisfied with their own conclusions. They have either been misled by the etymology of the terms to expect they should find more than they had warrant to seek for, or else they have confounded metaphysical substance with actually existing things.

Locke's view of
Substance and
Attribute.

Locke observes, "We have no such clear idea at all and therefore signify nothing by the word substance, but only an uncertain supposition of we know not what." (B. I. c. 4, § 18.) And again, "Of substance we know not what it is but only a confused obscure one of what it does." (B. II. c. 13, § 19.) Again, "Not imagining how these simple ideas can subsist by themselves, we accustom ourselves to suppose some substratum wherein they

do subsist as if from which they do result, which, therefore, we call substance." (II. c. 28, § 1.) "The idea of pure substance in general, is only a supposition of we know not what support of such qualities as are capable of producing simple ideas in us." (23, § 2.) And yet Locke grounds the supposition in question on 'the repugnancy to our conceptions that modes and accidents should subsist by themselves,' i. e., "that we cannot conceive how simple ideas of sensible qualities should subsist alone, and therefore, we suppose them to exist in, and to be supported by, some common subject; which support we denote by the name substance." (23, § 4.)

Views of Hume. Hume says, "The idea of a substance as well as that of a mode, is nothing but a collection of simple ideas, that are united by the imagination and have a particular name assigned them, by which we are able to recall, either to ourselves or others, that collection. But the difference between these ideas consists in this, that the particular qualities which form a substance are commonly referred to an unknown something, in which they are supposed to inhere; or granting this fiction should not take place, are at least supposed to be closely and inseparably connected by the relations of contiguity and causation." *Hume, Nat. P. I. c. 6.*

Of Reid. Reid says, "I perceive in a billiard-ball, figure, color, and motion, but the ball is not figure, nor is it color, nor motion, nor all these taken together; it is something that has figure, and color, and motion. This is a dictate of nature and the belief of all mankind. As to the nature of this something, I am afraid I can give little account of it, but that it has the qualities which our senses discover." *Essays on Int. Powers, Rem.*

I. c. 19.

But how do we know that they are qualities, and cannot exist without a subject? To this Reid replies, "I confess I cannot explain how we know that they cannot exist without a subject any more than I can explain how we know that they exist. We have the information of nature for their existence, and I think we have the information of nature that they are qualities." *Id. Of Ess. I. c. 2; also, Ess. VI. c. 6, § 6.*

Of Kant. Kant gives the following as the result of his critical inquiry: The *Ding an sich* (the thing by itself) is simply unattainable by human research, and yet the philosopher is doomed to follow after it over bush and briar, as after an ignis fatuus, which he never can reach. The substance without attributes can neither in the world of matter nor in the world of spirit be actually discovered or laid hold of. The distinction is made by the mind alone. The substance which underlies the attributes and is manifested through activities in phenomena, is only discerned in thought. It is a *Noumenon*, or thought object, as distinguished from the *Phenomenon*, or object known to sense and consciousness. The one is interpreted by the other. The authority of this distinction and of our belief in its validity is, however, with and for man alone. It is discerned under a form of thinking which is indeed necessary to the human intellect, but of which we cannot assert or know that it corresponds to any objective reality.

Of Whewell. Whewell adopts in substance the theory of Kant, and yet combines with it a mode of speaking and of thought borrowed from Locke and Reid. "An apple which is red and round and hard, is not merely redness and roundness and hardness; these circumstances may all alter while the apple remains the same apple. Behind or under these appearances which we see, we conceive something of which we think; or, to use the metaphor which obtained currency among the ancient philosophers, the attributes and qualities which we observe are supported by and inherent in something; and this something is called a *substratum* or *substances*—that which stands beneath the apparent qualities and supports them." *Hist. Scient. Ideas*, vol. ii. p. 30. The terms 'conceive' and 'think' are used by Whewell in a technical way, as equivalent to imposing upon the phenomena the "conceptions of the understanding" and "the forms of thought" in the Kantian sense, so that, in the meaning of that philosopher, the substance is a *noumenon* as distinguished from a *phenomenon*. But when he speaks of substances as behind or under these appearances, he adopts the views of Locke and Reid, although in the remainder of this very sentence he recognises such a use of substance or substratum as a "metaphor."

Substance in the abstract; how defined.

§ 644. In order to avoid the confusion and embarrassment into which philosophers have so generally fallen from confounding abstract and real or concrete substance, we will consider the two apart and somewhat more particularly than we have done already.

I. Substance in the abstract.

The concept substance is less general than that of simple being. Being has already been explained to be correlate to and coextensive with knowledge, inasmuch as it is applicable to every object that is, or that is con-

ceived to be knowable or known. But every thing that is known is not only known to be, but is also known as related. Hence, with every act of knowledge, the concept of *being as related*, at once arises and becomes universally applicable to every object that is known. Certain of these relations may be used to distinguish, define and explain these knowable objects. The concept of being with relations so discerned and applied is the abstract concept of substance. It is not like the concept being, a simple concept, but it is complex, and made up of the two elements *being* and *related*. It is more even than this. It is *being distinguishable as a permanent sort or class by a complex of relations*.

II. *Of attribute in the abstract.*

Attribute in the abstract defined.

§ 645. The conception of attribute arises in a similar way. As soon as an object is discerned in a definite relation to another object, this relation can be affirmed of or attributed to this object. When one or more attributes can be applied to define or distinguish, any one of these gives the generic conception of attribute, as used in this technical sense. *Every relation by which an object is known or distinguished is an attribute* in the largest and most abstract sense of the word.

Whenever we think of a being as *possibly*, but not actually related or distinguished by its relations, we think of it as a substance without attributes. In the same manner, when we think of a real or possible relation, we may think of an attribute as such, without a substance. Now, there are as many kinds of attributes supposable as there are distinguishable kinds of relations. There are attributes of time and space with all the relations which these involve and render possible. There are attributes of causality and design. There are also as many kinds of substances as there are beings distinguishable in kind by combinations of relations. *An individual substance* is known only by the individual relations which it shares with no other. *The substance is not, however, made up or constituted, by its relations. It is known in fact as a being holding relations. It is known in thought, by its relations or attributes.* From this analysis it is manifest that the category of substance and attribute is not simple and original like the other categories which we have considered, but is complex and derived. Any one of these relations, when employed for the ends of recognition or description, for definition or classification, for reasoning or explanation; in short, for knowledge of any sort, whether common or scientific, becomes an attribute. Any thing that is, when it is sufficiently permanent or oft-recurring to require to be known by attributes, is a substance.

This analysis also explains the affinity between real substance and the logical and grammatical subjects. All these are conceived to be objects of knowledge in some relation to one another, and hence are all conceived to be capable of attributes. The logical and grammatical subjects are for the moment conceived and treated as real beings in real relations.

The meaning or import of these concepts can only be explained and imaged by concrete or individual instances. As being is interpretable by any object known, and is explained to the mind by any act of knowing, so substance and attribute are explained by any completed act of knowledge which apprehends or distinguishes any object by its relations. When the mind generalizes the object as thus apprehended by the mind, it knows what the concepts, substance and attribute signify in their most general imports. This may suffice for these concepts in the abstract.

Substance and attribute in the concrete.

We will next consider them in the concrete, and inquire whether this analysis is justified when it is applied to really existing agents and things. We take the abstract concepts already explained and defined—of substance as something knowable by its relations, and of attribute as one or more of these relations,—and proceed to apply them to the different kinds of actual substances and attributes. Or rather, by considering the concrete, we propose to test the correctness of our definitions of substance and attribute in the abstract. We hope also in this way to clear up the difficulties and confusion which have been encountered in the various applications and interpretations of these terms. This examination will involve an inquiry as to the different senses in which these concepts are used and understood, and the terms which correspond to them, according to the subject-matter to which they are applied.

There are three classes of objects-matter to which the category is most frequently applied, *spiritual substances*, *corporeal substances*, and *mathematical entities*. *Abstract ideas*, or *abstracta*, follow the analogy of real beings, and so do grammatical subjects, as has already been explained. Mathematical entities do the same so far as this relation is concerned, as we have also explained at length. We shall consider the two first only, and begin with

III. *Mental or Spiritual substance.*

Spiritual or mental substance, misconceived.

§ 646. Here we encounter, at the outset, the objection or difficulty that a mental or spiritual being cannot be a substance at all. This difficulty is merely verbal. It is of purely casual association, and arises simply from the fact that the term is usually applied in a specific sense as implying material existence, and not in one more generic as equally appropriate to beings which are spiritual. Dismissing this objection as merely verbal and superficial, we proceed to inquire in what sense a spirit is a substance with attributes. It will be more satisfactory, also, if we consider, not spiritual substance in the largest acceptance of the term, but in the form which it assumes as the human soul. With this we are familiar by our previous analysis, and are now prepared advantageously to ask and to answer what this analysis has taught us in respect to its attributes and its substance.

To know, feel, and will, are causative energies.

The prominent attributes of the substance which we call the human soul, are its capacities to know, to feel, and to will. It is usually distinguished and defined by these. But to know, to feel, to will, are operations or modes of activity and suffering. They are energies which are simply causative of certain effects, or which involve energies that are causative. These three attributes obviously fall under the category or *relation* of *causation*, and are simply special examples of its occurrence.

What it is to know, to feel, and to will, we can only know by the conscious exercise or experience of these operations. The products of these operations are beings in the philosophical meaning of the word, and in respect to them we affirm a cause which is that substance which we call the soul.

These referred
to the *ego* as
cause.

But we know more of the substance of the soul than that it is the cause or recipient of those effects which we call its states. It is involved in consciousness that the soul knows these acts and states to be its own; i. e., to be caused or suffered by the individual *ego*, or *self*. What is known is the agent causing and suffering, as well as the effects. The soul under certain conditions and limitations is known itself to act and suffer. But the relations of the soul thus known do not take it out of the category of causation, but rather require more imperatively that this attribute should be referred to this very class. So true and striking is this that many have contended that the conscious energy of the soul in knowing and in willing (in one or both) originates the conception and explains the belief of causation.

The power of the soul *to be conscious*, or *consciously* to know, is also a capacity for causal efficiency, and when attributed to the soul is attributed simply as one of its causal relations, known as the others by its exercise and its results.

These states or products of the soul's causal activity, are transient and changing, but the *ego* is *permanent* and *enduring*. As the cause or recipient of these changes the soul is *identical* with itself. They are diverse, the soul is one. The attributes require only the categories of the soul which consciousness reveals of *identity*, *diversity* and *time*.

Unconscious
psychical powers
are causative.

§ 647. Besides the attributes of the soul which are revealed in consciousness, it is capable of acts or processes of which it is conscious only of *the results*. All those spiritual capacities which fit it to act in conjunction with the body in preparing or presenting to itself the objects of sense-perception are known only as effects of the joint action of spiritual and corporeal causes. They are therefore only a peculiar species of *causative attributes*.

The similar capacities of the soul to represent any object of previous experience whether subjective or objective, whether intellectual, emotional or voluntary, are *causative attributes* which are definitely and distinguishably known by their effects. Its presumed capacities to exist in other conditions of being, with or without a body and environed by another sphere, come under the same category.

Of all these causative energies the conditions are in part furnished by the soul itself; as when memory, imagination, and thought act on the materials furnished for it by the previous action of the soul in acquisitive and intuitive knowledge. In respect to these conditions, the soul is dependent upon its own nature, for it is a being as well as a causative agent. For other conditions of its causative energies, it is dependent on the material world. Each of these classes of causal activities are exercised according to their appropriate laws.

Attributes of
design in the
soul.

§ 648. Besides the relations of *causation* there are relations of *design* which pertain to the soul. These are conspicuous both in the relations of one power and act of the soul to another, and also in the relations of the soul to the external world and the body which connects it with that world. All of these relations are attributes of the soul, and some are so necessary to an adequate concep-

tion of its nature as to deserve to be counted among its essential attributes. This suggests the distinction between these attributes as *essential* and *non-essential*. The essential attributes are peculiar in this, that they are necessary to the very conception of the soul as such, and so far are logically essential. They are also found actually present in a class of individual beings, which exist under the permanent laws or order of the universe, and are *essential* to the operation of its laws and the designs of its being. Other attributes are called *properties* not because they are less universal or necessary under the fixed constitution of things, nor because they are less inevitable and essential as causes to account for phenomena, but only because they are not required for the ends of logical knowledge to define and distinguish the soul from other kinds of being.

As has already been said, when attributes are spoken of especially as belonging to a substance, it is the essential attributes which are intended; those which constitute and define a class or species and which are present in permanently existing individuals, as in the inorganic world, or are perpetually reproduced, as in the world of life.

Individual attributes of the soul.

Besides these attributes which are common to all souls, and which are essential to the logical conception of all, there are attributes or relations of each individual soul, which are known and knowable by each individual to and of himself. Each individual ego is the subject and agent of his own acts and states. Those which are his own, he knows by intuition, as well as the ego which acts and supposes them. This ego is most conspicuously manifested in the will. Its interests and character constitute the ends and aims of individual activity.

How far the ego is the type of all substance.

The inquirer for spiritual substance would say, perhaps, here is the substance of the soul. Perhaps in this permanent ego as related to its diverse and changing acts and products may be detected the real spiritual substance which is the origin and type of the various corporeal substances, which we invest with their appropriate attributes. On looking more closely, he finds that this ego is a being, though it is directly known in a way quite unique and peculiar. To know the ego is a being, is not to know it is a substance. That a substance must be a being all concede, but in order that it may be known also as a substance, it must be known in certain relations, and it is by its capacity to exist and be known in these relations that it is known also as a substance. Those relations of the individual ego which are commonly recognized and by which it is distinguished and defined, are its capacities to do and to suffer, to know and attain its end or destiny. These are the attributes of this peculiar being, which as *distinguished and defined* by these is called *spiritual substance*. These attributes are all found in the Categories of Causation and Design. When to these we add its relations of Identity and Time we complete the cycle of its attributes. From this Induction we derive the following definition.

Human spiritual substance defined.

§ 649. *That Substance which we call the human soul, is an identical enduring self, capable of spiritual acts and states in the succession of time, and adapted to certain ends for itself and the universe of being.* The relation of substance and attribute asserted in this definition is that of a being on the one hand, of which on the other a variety of relations is affirmed, as of time, identity, causation and design.

Certain causal attributes are its faculties.

Of these relations, those which are especially prominent are *the causative*. These are its so-called Faculties, which are capacities for special and distinguishable modes of causal activity. By these attributes it is adequately distinguished from other kinds of being. Even the human soul is effectually distinguished by these faculties from the other species of spiritual being. When the soul is thought or spoken of as a substance, it should be thought of as endowed with causal attributes, and by these can all spiritual substance be best defined. If the attempt is made to measure the soul by the body, or to affirm of it relations or endowments which are like the corporeal, the mind either supplies the little that it knows by some gross or refined theory of materialism or falls into vague or fantastic imagery. This explains why the impression is tenaciously held that substance—i. e. definable being—must necessarily be hard and material, even when it is applied to spirit. But this impression, as we have seen, is not well founded.

Mr. Mill's conception of the Soul.

Mr. J. Stuart Mill, in his *Examination of Sir William Hamilton's Philosophy*, chap. xii., has given a laborious explanation of our conception of the mind or soul, upon the principle of what he calls 'the Psychological Theory,'—which in reality signifies the Associational Psychology. He first resolves our belief that "the mind exists" into "the belief of a permanent possibility of its states." He then asserts that our belief in its existence when it is inactive, contains nothing more than "that my capability of feeling is not, in that interval, permanently destroyed." He then adds that the mind is defined "as nothing but the series of our sensations as they" actually "occur with the addition of infinite possibilities for their actual realisation." Again, "the mind is but a series of feelings, or, as it has been called, a thread of consciousness, however supplemented by believed possibilities of consciousness." Again, he speaks of "the theory which resolves mind into a series of feelings, with a background of possibilities of feelings." Again, "if we speak of the mind as a series of feelings, we are obliged to complete the statement by calling it a *series of feelings which is aware of itself as past and future*; and we are reduced to the alternative of believing that the mind or Ego is something different from any series of feelings or possibilities of them, or of accepting the paradox that something which, *ex hypothesi*, is but a series of feelings, can be aware of itself as a series. The truth is that we are here face to face with that final inexplicability at which, as Sir William Hamilton observes, we inevitably arrive when we reach ultimate facts," etc.

One scarcely knows which most to admire in these statements, the clearness of the perception of the difficulty which embarrasses the author's own theory, or the failure to observe that the difficulty originates solely *ex hypothesi* Millian. The question is simply, what are the ultimate facts which are finally inexplicable? Do they or do they not involve the recognition of the self-conscious ego, identical, existing in time, as Mill denies; or "of a series of feelings aware of itself as past and future?" Is the conception of the soul truly expressed when it is resolved into "permanent possibilities of sensation;" or by the assertion to it of Faculties, under the category of *causation* believed to be universal and necessary? Is "the background of possibilities of feeling" and "of infinite possibilities for their actual realisation" a happy substitute for the *assumption of design* as necessary in order to explain our belief in the continued existence of an agent, even though it is not consciously active; and in its permanent adaptation to the forces of the universe which are the conditions of its existence and its activity?

IV. *Material substance.*

Material substance defined.

§ 650. Every material substance is, like spiritual substance, a being discerned or discernible by intuitive or direct knowledge and also definable by a sufficient variety and number of relations to distinguish it from other beings. These relations are discerned by thought, and exist between itself and other substances, material and spiritual. *A material substance may be defined, a being occupying definite limits in space, and productive of specific sensations in the sentient soul on occasion of which it is perceived or known to exist.*

Its trinal extension.

First of all, it is related to space in trinal extension. It might be urged that, in one sense, the spectrum cast by the camera on a screen, or the rainbow flung athwart a cloud are material substances, with only superficial or binal extension; but

material substance, in the ordinary sense, has threefold extension, or, as we say, extension in three dimensions. These, arranged in some form, are, as has been sufficiently explained, its *indicia* and evidences as far as they go, and essential to its very notion.

Corporeal substance has a *second* relation to space, viz., that *Impenetrability*. of space-occupying or space-filling. This is often called the solidity or impenetrability of matter, but should be carefully distinguished from that power of matter to awaken the sensation of hardness, which is also called solidity. The first is a relation to space which is tested and expressed by the application of motion. The second is the capacity of the body to excite a specific sensation upon the pressure of touch.

These relations of corporeal substance to space are all represented or generalized by means of motion or the movableness of body in three directions, as has already been explained, § 577.

The *third* class of relations which belong to corporeal substance are its powers variously to affect, through the senses, the body as animated and ensouled, and also the soul itself as a sentient agent. Every material substance has power to produce certain so-called impressions on the so-called organs of sensation, i.e. upon the body as organized to receive these impressions. Of these effects the vibration of the tympanum, and the formation of the image on the retina, are sufficient examples. These may occur without sensation, as is manifest in cases of disease, of mental excitement, and of the use of anæsthetic agents. But the condition of these effects even, is a vitalized or living body. Consequent upon these are those effects upon the sensitive or sentient soul which are called sensations, or sensations proper. The condition of the last is a body living and ensouled. In sensation, or rather, in the sense-element of the complex act called sense-perception, the soul is purely receptive or passive and the material substance is active: that is, it is causative of the various distinguishable effects which are known by experience. Its various powers to produce these sensations are all comprehended under the *category* or *relation* of *causation*.

Its several sensible qualities.

Can matter cause perceptions as distinguished from sensations?

Into this category of causative forces others bring the power claimed for matter to produce perceptions in the soul. According to their theory, every act or state of perception of material objects is an effect which is wrought upon the soul by the efficient causation of material substance, or which, at the utmost, is the effect of the joint action of the two factors or co-efficient agents, viz., causative matter and causative mind. The first is the view of John Stuart Mill: "A body, according to the received doctrine of modern metaphysicians, may be defined, the external cause to which we ascribe our sensations. When I see and touch a piece of gold, I am conscious of a sensation of a yellow color, and sensations of hardness and weight, and by varying the mode of handling, I may add to these sensations many others completely distinct from them. The sensations are all of which I am directly conscious; but I consider them as produced by something not only existing independently of my will but external to my bodily organs and to my mind. This external something I call a Body." *Logic*, I. c. 3, § 7.

"Matter, then, may be defined a Permanent Possibility of Sensation. I affirm with confidence, that this conception of matter includes the whole meaning attached to it by the common world, apart from philosophical and sometimes from theological theories." *Exam. of Hamilton's Phil.*, c. xi.

Similar to this is the view of Dr. Thomas Brown. *Lectures*, 20-25.

The second view is held by Kant and in part countenanced by Hamilton, and regards knowledge as the joint product of two causative agents, viz., body with its agencies upon sense giving the *matter*, and the mind with its constitution furnishing the *forms* of knowledge. This view, unlike the first, does not sink the mind into a mere recipient of the impressions caused by the body, but it makes the mind itself a joint cause of the effect; holding the activity of the mind in knowing, to be coördinate with and similar to the causal activity of matter upon the senses. Kant carries this mistake to its worst possible extreme by suggesting that the constitution of the mind as a co-factor to the effect might also be changeable, and with it the nature of knowledge itself. Hamilton holds back from this conclusion, but seems often in part to sanction it when he insists that all knowledge is relative to our faculties and that many fundamental relations are only necessary from the impotence of our powers, *i. e.*, necessary to us only as we are human, and *relatively* to this human constitution.

§ 551. It is serious error to class among the attributes of matter the capacity to be perceived or known. The possibility of being perceived *as in itself* no attribute of matter in the sense of causative power. To perceive is an act of the mind. The causative energy and the capacity which fits for it, both pertain to this mind alone. The matter, so far as perceived, acts neither upon the body nor the soul. The matter is, *i. e.*, exists, and is known to be. Nor is it correct to say, that it is known only *as* the cause of the sensations which the soul suffers or receives; making it to be known only as the *unknown cause* of a *felt* effect. We should rather say, it is known *to be and known as causing* these sensations, *i. e.*, is known to be *and* to be causally related, cf. § 49.

In that complex state which we call sense-perception, in which the *activity* of the soul as knowing is blended with the passivity of the soul as *sentient*, we cannot indeed separate the object which is known from the state which is suffered, but that the two are diverse we know, and that objective reality belongs to the one and subjective transitoriness to the other, we are also certain. Space is a reality, and so are the spatial relations of the object known. The apprehension of being is conditioned by the presence of matter acting on the sensorium and the sentient mind. But neither the mind's state of knowing nor the object as known are the product of the causative powers of matter acting alone or in conjunction with other causative powers of the mind. To know *is an act*, and is simply to be certain that its object is, even though that object also is known to be acting on the agent which perceives or knows.

Besides the relations of material substances to the animated and ensouled body, there is a class of relations which it holds to other bodies. These are its powers to produce effects in or upon them. They comprehend all the properties of matter whatever, whether mechanical, chemical, or organic, which have as yet been discovered, or which science may in future unfold. That all these attributes are comprehended under the *causal relation* is too obvious to need illustration or proof.

The so-called
properties of
matter.

§ 552. Many of these are called not the *attributes* of matter, but simply its *properties*, for the reason that they are not required to define and distinguish it from other kinds of being. They are not involved in the essence of the notion matter. They are not revealed by the analysis of this notion, but are either superinduced upon its content by the processes of induction and observation, or are perhaps deduced from its original and essential constituents, or from what these constituents involve in the way of necessary inference when coupled with the enlarged knowledge respecting them which induction gives.

The relations considered thus far are those of *space and causation*. The analysis has established our definition of material substance to be correct, viz., that it is a being having a definite form or outline, (*involving relations to space or other bodies existing in space*), occupying exclusively some portion of space, (*involving space-relations*), and productive of specific sensations in the sentient soul on occasion of which it is known to be, (*involving relations of causation*).

These attributes distinguish and define, but do not constitute matter.

It is further to be observed that this complex or collection of relations does not constitute material substance. The so-called "collection of attributes" which Locke, and Hume, and Brown, and J. Mill speak of, do not by their union or union make matter to become substance; they simply indicate that it is a material substance. They are relations which define and distinguish it as such. They constitute its *logical essence* only. They make up the content of the complex notion called material substance. They constitute the concept which we affirm of all matter, but they do not constitute material substance itself. Even simple notions, as *red* and *white*, suppose the reality to be known which they generalize, and can only be interpreted by that real knowledge of their import which is obtained by sense-perception. The union of these constituents into a complex notion does not dispense with a similar reference to real knowledge. The same is true of the element *being* which is implied in such definition. *Being*, like every other simple notion, cannot be defined; but it does not follow, as we have already seen, § 544, that it cannot be known and understood. To know and explain it, we need only refer to what we do and gain in every act of direct or real knowledge. By a reference to this experience, we explain the meaning of the notion, and of the word.

Space occupation by matter.

§ 653. A material substance has been defined as exclusively occupying a portion of space. It is not required that this portion of space should be of any definite size or dimensions. A grain of sand is a material substance, so is a huge mass of sand-stone. So is a mass of water or the indefinitely expanded atmosphere. All that is required is, that the mass, be it greater or smaller, should be so fixed and held together in its parts as to occupy continuously their defined limits. The continuity of parts is of more importance than the continuity of definite outline. This continuity or coherence of parts is maintained in different substances by different agencies. The constituent parts may be held together by simple mechanical aggregation under the force of cohesive attraction. They may be held more closely by the polar force of crystalline arrangement. They may be united still more intimately under the laws of chemical affinity. They may be combined and assimilated into the forms and products of organic existence; or the substance may be conceived as an ultimate molecule, or monadical cell. Every being, that is one and continuous, of whatever size, in whatever form, or held by whatever bond of union, is a material substance.

Permanence of space-occupation.

A certain continuity in time or permanence is also required as a defining characteristic of substance, or is implied in its definition. This integrity of the whole is presumed as having continued and as likely to continue for some considerable period, or the being indicated would scarcely be called a

substance. It certainly would not be worth noticing by defining attributes if it did not so remain. There are certain chemical substances that only remain solid under extreme cold and pressure. Of these perhaps the most conspicuous is *carbonic acid gas*, which when made solid has definite and peculiar attributes. Were it not that it can be constantly produced from materials and by processes within the reach of every chemist, it would not be known or named at all. What this so-called substance is to its constituent elements and laws, every organic being is to the agencies that sustain it in its continued existence and functions. Whether it be the ephemeris that exists for an hour or the elephant that survives a century, the animal structure is sustained by food and air, etc. When these decay or the capacity to appropriate them fails, the elements take another form as truly as do those of the solidified carbonic acid, or of the fitful globule of potassium. So is it with the tiny plant of a week, with the cedars of Lebanon, and the yew that counts its age by centuries. They exist by the conspiring and sustaining force of the whole of the globe which gives a standing place and food, of the surrounding atmosphere which furnishes moisture and gaseous pabulum, and the sun which directly imparts its stimulating light and heat, and indirectly controls the rain and the dew.

§ 654. The relative permanence of material substance explains the possibility of its identity. Identity in such a substance may pertain to the constituent elements only, or to the form only, or to the uniting force, or it may be applied to the connection of one part with another in a series of changes which involve a total alteration of both constituents and form. Thus if the same particles remain united in the same form by mechanical aggregation, the substance is eminently the same; the only diversity in such a case being that of relation to the person affirming it—a diversity of time or place or both. Should the constituents remain the same and the form be changed, it would be called the same, because the constituents are viewed as more important than the form. If the external form is changed by growth or development, as in plants or animals, the force that unites the parts is regarded as making them a substance. If the parts of a knife or a ship are displaced and replaced by successive removals and substitutions while the form and functions are retained, the substance is still called the same by a loose analogy taken from living agents and their gradual accretion and growth.

An individual material substance: How defined?

Still further: the material substance thus defined is only the general notion of substance, which is equally applicable to every individual substance. But can we not define an individual substance? The nearest approach to such a definition is by means of the relations of both time and space conjoined.

An individual material substance is a being occupying exclusively a portion of space at a given portion of time. Either of these relations alone, as is obvious, is general and applicable to any material substance, but both together can only be affirmed of a single one. These two give the *principle or definition of individuation* so far as it can be accomplished by general or common relations. The adjective *this* indicates the same, for the service of language; hence the speculations of the schoolmen respecting the *hæcceitas* of any existing thing; which they sought to treat as a generalized attribute. The relations to the ego of the mental acts and states of which the individual is directly conscious, in a similar sense individualize the conception of mental substance, evidencing its reality and explaining its meaning.

The production
of new sub-
stances.

§ 655. We have seen that a change in form and structure or both, involves the production of a new substance, because it involves the production of relations which clearly distinguish such a substance. A living being, as an animal, consists in part of certain material particles or elements. If a succession of changes or decompositions and recompositions could go on before our eyes, so that we could trace the same particles back through every form in which they can possibly exist, through plant, mineral, earth, air, water, and in every possible form of chemical and crystalline combination, till we had reached the ultimate molecules, or elements of all and of each, we should evolve a series of substances, one after another, in a consecutive order of gradation.

Ultimate parti-
cles or elements.

But the simplest elements, the ultimate particles, would still be substances with attributes with which they must still exist, and from which they could never in fact be parted. Those who seek an interior substance, constituting the nucleus or core of the outer, are misled by a secondary use of the word. If a momentary form of being is resolved into its more permanent constituents, these often are called its substance, and so in general those forces and laws which are relatively permanent are called by *eminence* substantial and real. These are ordinarily solid, compact, and tangible, in contrast with the loosely-cohesive, the diffused, and impalpable. For this reason the former are counted substantial. The more fixed and permanent are usually more obvious to the grosser senses, especially the sense of touch, which for so many reasons is the leading sense. The case of solidified carbonic acid is an exception to this rule, and it shows that such an application of the word substance is accidental only, and not solidly grounded.

The real Essence
of Philosophy or
the *Thing in
itself*.

In assuming or seeking for such a substance philosophers have lost sight of the philosophical conception of substance and have substituted in its place one that is narrower and purely accidental. When Locke, for example, speaks of the real essence as "that real constitution of any thing, which is the foundation of those properties that are combined in, and are constantly found to co-exist with the nominal essence; that particular constitution, which every thing has within itself, without any relation to any thing without," the real essence here supposed, if it is a constitution of any thing on which its properties depend, must be either itself one or more material force or agent, or its properties or laws—*i. e.*, it must be itself matter or the relations of matter. If it is matter, it is still substance with attributes. If it is a relation of matter, it is an attribute requiring a substance of which it may be affirmed. On either supposition this real constitution of a thing on which its properties depend, leaves us as far as ever from attaining to an interior substance *by itself*. Whether or not Locke would have allowed that he intended by his "real essence" what he elsewhere calls "substance," it is evident that all who conceive a substance to "underlie" the attributes, and who make efforts to "unearth" it, can have no other conception of it, than some "fixed constitution" on which these attributes depend. The "underlying substance" of the schools, the "*thing in itself*" of Kant, are mere names, which signify either being in the abstract or being in the concrete. If it is being in the abstract, then it must be synonymous with matter as knowable, *i. e.*, it is a concept only which can be separate from its relations in thought but never in fact. If it is being in the concrete, then this must be known *with* its relations and never apart from them. In either case the substance or thing *in itself*, cannot be known *by itself*.

A material sub-
stance not neces-
sarily independ-
ent.

§ 656. It is not essential to a material substance that it be independent or self-subsistent. This was insisted on by Spinoza, who defines substance to be "*that which exists and is conceived by itself*." "*Per substantiam intelligo id quod in se est et per se concipitur; hoc est id cujus conceptus non indiget conceptu alterius rei a quo formari debeat.*" *Ethices*, p. i. def. 3.

From this definition the inference was direct and irresistible, that no

finite substance is possible, because every so-called finite material substance is produced or sustained by other material beings, and is dependent on them; or, on the other hand, there is but one such substance, and that is the total of all which exist—the universe; this totality being conceived as absolute and independent. Locke falls into a similar manner of speaking in the sentence just quoted, when he speaks of the constitution “which every thing has within itself without any relation to any thing without.” Similar to this is the doctrine of Whewell, that substance is indestructible. “The supposition of the existence of substance is so far from being uncertain, that it carries with it irresistible conviction, and substance is necessarily conceived as something which cannot be produced or destroyed.” *Hist. of Scient. Ideas*, vol. ii. p. 32.

Our analysis has shown that a material substance is so far from being independent of other beings and forces, that, properly speaking, no material substance is in any sense independent, or can be conceived to be so. Every material substance is what it is by the productive or sustaining force of all other beings and forces in the universe. It is also conceived and defined to be what it is by its relations to these forces, expressly and impliedly. It cannot exist and cannot be defined except by these relations to other beings and agencies. The solidified carbonic acid is no more truly dependent for its being on the pressure and cold that hold fast its constituents, than the oak that for centuries has thrust its roots into the crevices of the eternal rock, or than the rock itself or the solid substance of the earth, are dependent upon the agencies that hold them in place, and conditionate the functions of each. Modern science has impressed this lesson upon all its devotees, that *the one* lives in and depends upon the all, and that the all makes itself felt in the one also: that nothing in the universe is independent and nothing inconsiderable, that the forces and laws which move and sway the whole; produce, sustain, develop, and destroy every individual.

If material substance is dependent, it is not necessarily indestructible. If the forces which sustain it are withdrawn, or their action is changed, it ceases to be, or ceases to be the same substance that it was. It may be an induction which is well grounded in observation, that the ultimate material particles or molecules will not be destroyed; but to call these the only material substances is to use the word in a narrow and special sense. Our belief in the indestructibility of these ultimate particles is not an axiom, but is founded on other assumptions, coupled with extended observation of facts and wide-reaching analogies.

§ 657. And yet we do assume, that material substances are permanent,—not the ultimate particles alone, but even the continuous forms in which they exist and perpetually reappear. If we did not assume this, we should not define the constituents of either, we should not form them into concepts, or apply these concepts for the ends of knowledge. What is the nature and what are the grounds of this assumption? In its nature it is none other than that the agencies and laws which sustain and produce them will remain, at least till they have accomplished the ends for which they exist. In other words, it is only by relations of orderly design that we can explain or vindicate that belief in the permanence of the material structure as to its forms of being and their constituents which is received as an axiom in all physical or inductive

Not indestructible.
Our belief in the permanence grounded in design.

philosophy. That this permanence or indestructibility is not essential or necessary, that it cannot be viewed as of itself an axiom, appears from the broader and deeper axioms into which it may be resolved, and on which it rests.

When on the one hand, we show that all things which seem most solid and permanent in matter, are the constant products of the elements and forces which bring and hold them together, we seem to dissipate all substance into moving and struggling particles, and to resolve the universe itself into a flux of changing forces: Substance is dissipated into shadow, and the solid earth with all its forms of being and of life, is liable to be disintegrated into chaos. But when, on the other hand, we assume design to control and fix these forces and laws, we provide for permanence in the products of these forces, for fixedness in material substance, and in the mind which interprets material being.

Dogmas that seem to deny permanence.

There are philosophers who deny that there are permanent forms or elements of material substance. Such believe that nothing is fixed, either in substance or attributes; that every thing in the universe is in a perpetual flux, that the law of development controls all existence, so that one form and species of being is evolved from another—the more complex from the more simple—in endless progression. ‘There is no permanence in the species or forms of organic matter, or among living beings, but the tendency to development creates new forms, and these again others still more complex by endless change and progress. The permanence which we think we observe, and which we recognize in language, is only relative. Compared with the endless evolutions of ages, it is brief and transitional.’

The grounds alleged for this dogma, are the varieties actually observed within the species and forms of being usually considered as permanent and fixed, and the extension of the law supposed to be thus indicated to a wider range of supposed deviations, and the application of it on a scale measured by the lapse of enormous periods of time. One relation of permanence in nature must, however, be assumed by all these philosophers, and that is, *the permanence of this law or principle of development itself*. If it be assumed from the limited facts and observations adduced, that this law of development has prevailed in all the ages, and evolved one form of being after another, by a steady progress and in regular order; then the permanence of the law of development itself must be referred to a fixed purpose and design of nature. If it is accepted as the product of induction, induction itself, with its underlying axioms and rules of practice rests upon assumed design. The law of development cannot, therefore, drive the fact of design out of the universe, nor dispense with the assumption of design as one of the axioms of science.

V. *The mutual relations of material and spiritual substance* next claim our attention.

The reciprocal relations of material and spiritual substance.

§ 658. This is a subject of special difficulty and importance. Many of the attributes of both mind and matter can only be explained and understood by means of one another. The one can be defined and known only by the other. To understand and describe the one we must make use of the other. But the two are in some

important respects very unlike. In bringing mind and matter under the categories of substance and attribute, we are constantly impelled to make prominent the features which are common to both. And yet it is here most essential that we notice the points in which they are especially unlike. In order to do this with success, we must first consider the difference between *the direct and reflex knowledge* of both matter and spirit, to which the mind is competent.

Mind and matter directly known.

The mind knows both matter and mind by direct and reflex knowledge. By direct knowledge in sense-perception, it knows matter as a being, i. e. the object of its knowing. By direct knowledge in consciousness, it knows itself as the agent which knows matter, and is also the subject of certain sensations. It knows both these objects in certain relations. It knows matter not only to exist, but to be diverse from itself the knower, and to be extended: it knows itself to exist, and enduringly to feel and act. The relations involved in this direct knowledge of matter and mind are common and diverse, and are possible by their respective relations to space and time.

Relations of causation and design may also be affirmed of both matter and mind, while each is the object of the mind's direct cognition. Thus one material object may be viewed as the cause of a change in another, and even of the existence of another material object. Thus the mind itself, as objective to its own consciousness, may be viewed as the cause of its own spiritual states, or of any effects that are known or seem to be within the reach of spiritual activity, whether these involve efficiency or design.

Reflex knowledge of both. Necessary but difficult.

The attributes of matter and mind, which are known by this direct knowledge, are easily analyzed and understood. But when mind and matter are by reflex knowledge viewed in their mutual relations; when their capacities to hold relations to one another or to act upon one another are considered, then the analysis becomes difficult, and the clear expression in language of the distinctions observed, is embarrassing. The two objects compared must be placed side by side before the comparing mind, by an act of indirect or reflex knowledge. In order to this, the mind, or rather the soul which is compared with matter, must be ideally separated from the intellect that compares the two. The acts and powers of the soul must be considered as sentient and perceptive. We have seen that the most important of the attributes involved are those of causation, and that the attributes of matter and of mind which are to be determined, are their capacities to produce effects upon one another. But what kind of effects? Effects of sensation only, or of perception also? We reply, effects of sensation only; for perception is no effect of matter upon the mind or soul (§ 651). In this product the mind only is active. But matter, when it is compared with the mind, is apprehended as the cause of certain sensations, and its capacities to produce these sensations, *define* its attributes or qualities. But in order to be known with attributes, it must have been known, by direct knowledge, as a *being*.

Matter known as being in order to be known as cause.

§ 659. In other words, in sense-perception, the intellect must know something more than effects, viz., specific sensations, as of touch, sight, etc., for which it assumes an

unknown cause, viz., the producer of these felt effects, and invests with attributes accordingly; for in this same sense-perception it knows matter as being as well as certain effects or sensations in itself. This is its prerogative as an agent competent to know. It not only knows itself and those acts and objects, that are purely spiritual, but it knows material objects also. If it did not know them directly as beings, it could not know them as extended or as diverse from itself, or as causal agents.

The process of inferring them as unknown causes of known effects, or as 'possibilities of sensation,' is too awkward to be received, and is beyond the capacities of the infant mind. They must be known by direct knowledge as beings producing sensations if the mind, when it compares the one agent with the other in indirect or reflex knowledge and applies to both the category of causation, is to be assured that there are two beings whose causative attributes it may determine. In sense-perception, the mind apprehends matter or material being. In touch, whether viewed as a special sense or as present in all the remaining senses, the mind does more than experience hardness which is intensified into a painful sensation by pressure; it does more than experience the muscular sensations which attend the use of the locomotive or muscular power; it knows *matter as being*, just as truly as it knows *the ego as being*.

These beings cannot be *defined* as beings, because we define by relations only. Being, spiritual or material, cannot be defined. We speak of beingness or entity as a relation, only by a forced use of thought and speech. When we define these beings—the *ego* and the *matter*, the spiritual and material substance—we use only their common and several relations; we recognize their attributes, whether these are relations of time and space, or of causation and design. But we assume and imply their being, and that we know the being of each by direct and satisfying knowledge. If we did not know them both to be, we should not seek to assign their respective attributes to each. We should not seek to separate the agency of each in the effects in which both are coefficient.

We say, then, without reserve, that the mind in sense-perception, knows matter or material being as truly and as directly as in consciousness it knows the *ego*, or mental being.

§ 660. These two beings which are separated and distinguished from one another by the dualistic analysis of direct knowledge, are again united as one by the synthesis of thought.

First of all they are united as *beings* under that all-comprehensive category, and *second*, by the similarities of the several relations which are common to both. The unknown and fleeting material substance that has eluded the definitions of philosophers, is the something which is known in every act of sense-perception: which is *defined*, indeed, by means of the relations of sense and of thought; but is not the less, but the more necessarily assumed to be. It is true, the most important of the relations of matter are its relations to the soul itself, and the most obtrusive of the affections of the soul are its sensations, but the soul, as intellect, has and discerns other relations than these. It is more than a conscious receiver of sensations. It has the power, by direct cognition, to know matter and spirit in higher relations than those of sense. It can know them in their respective relations to space and time, and, above all, it can unite them as adapted to one another in a common design. Both

Dualism of matter and mind overcome by unity of thought.

matter and spirit have certain common and separate relations to time and space, either in their acts or objects. Each, also, is known by relations of causation, material being by its relations to the soul as sentient, giving sensible qualities; psychical being by spiritual acts and states, and also by its capacities to be acted on through the body in sensation, and to act upon it in motion. They have relations to other material and mental beings. These beings, as defined by these relations, are called substances; for each holds a permanent existence and permanent relations to the other in the designs of nature and of God.

This analysis enables us to understand the possibility of a difference in the attributes of matter, and especially the division of these qualities into primary and secondary.

VI. *The Primary and Secondary qualities of Matter.*

Two-fold and three-fold classification. § 661. The qualities of matter have been divided into two classes, *Primary* and *Secondary*; and into three, *Primary*, *Secundo-Primary* and *Secondary*. Others have denied that there was any ground for dividing them at all, contending that there is no reason for recognising more than a single class. The older Greek philosophers—the *Atomists*—distinguished the qualities of hot and cold, sweet and bitter, and of color etc. as experienced by the soul; from the capacity in bodies to produce them. The quality in the body, in all these cases, they contended was some particular configuration of atoms.

Aristotle's classification. Aristotle, by applying the distinction between an object in capacity, *ἐν δυνάμει*, and an object in act, *ἐν ἐνέργειᾳ*, was led to distinctly recognise many of those which were after words called secondary qualities, as simply capacities in objects to produce by act sensations in the soul. In other words, they were recognised as powers, or, in modern phrase, they were relegated to the category of causation. But Aristotle distinguishes between common and proper sensibles, *ἀσθητὰ κοινὰ καὶ ἰδία*. Of the first he enumerates five: *Magnitude* (*Extension*), *Figure*, *Motion*, *Rest* and *Number*. These are simplified still further by him into one or two, of which motion is preëminent, or, as some of his interpreters contend, is all-comprehensive. Whether the common sensibles are apprehended by sense he would make a question, and this question was abundantly discussed by the later Aristotelians. That they are qualities of matter he would not doubt in the least, and that they correspond to the Primary qualities of his predecessors, there can be no question.

That of Descartes. Descartes distinguishes the two classes as follows: (1) *Magnitude*, *Figure*, *Motion*, *Situation*, *Duration*, and *Number*, etc., etc., are clearly perceived; (2) *Color*, *Pain*, *Odor*, and *Taste* are perceived in a very different manner. Of qualities of the first class we have an idea as they are or may be in fact or reality (*ut sunt aut saltem esse possunt*). Of those of the second we have only an *obscure* and *confused* conception of something which occasions the appropriate sensation. These are nothing but certain arrangements of *size*, *Figure*, and *motion* (*dispositiones quasdam in Magnitudine, Figura et Motu consistentes*). Of the one we have an *idea*, of the other a *sensation*. The essence of matter, according to Descartes, consists of extension, as that of mind consists of thought. Of course the knowledge of extension is the knowledge of matter as it is; while the knowledge of every thing else concerning matter, viz., its qualities or properties, must be of what it is *in relation* to the mind, i. e., to its *thoughts*, in the sense of Descartes, i. e., to its *sensations*.

Classification of Locke. § 662. The doctrine of Locke may be stated in the following propositions: (a.) A *Quality* in a body is its power to produce ideas in us. (b.) Primary qualities are such as are absolutely inseparable from a body in whatever state it may be. They are such as are essential to the very idea of matter. These original primary qualities are *Solidity*, *Extension*, *Figure*, *Motion* or *Rest* and *Number*. (B. II. a. 3, § 9.) To this he adds, in another place, *Bulk*. By *Number*, Hamilton supposes he means divisibility of the constituent parts. The *ideas* of these qualities are *resemblances* of them, and their *patterns* do really exist in the bodies themselves.

(c.) Secondary qualities are not essential to the idea of matter; matter can be conceived to exist without them. Moreover, they are powers to produce various sensations in us by means of the primary qualities, i. e., by the *bulk*, *figure*, *texture* and *motion* of their insensible parts, as *colors*, *sounds*, *tastes*, etc., etc. "The Ideas [i. e., sensations] produced in us by these secondary qualities have no resemblance of them at all." These divisions and definitions are peculiar in the arrangement which they make in the qualities enumerated under each class, but preëminently in that they involve a physical theory, not unlike that of the

ancient Atomists, that the secondary qualities can be explained by certain relations and motions of the primary qualities. They involve Locke's peculiar theory of knowledge as consisting in the apprehension of resemblances to or between ideas. Berkeley and Hume both rejected Locke's distinction of primary and secondary qualities, when they limited our knowledge of matter to that of ideas only, by a more rigid application of his definition of knowledge.

§ 663. Reid, in his *Inquiry*, enumerates as primary qualities, *Extension, Figure, Motion, Hardness and Softness, Roughness and Smoothness*; in his *Essays, Extension, Divisibility, Figure, Motion, Solidity, Hardness, Softness, and Fluidity* as so called by Locke. Laying out of view the questions which might arise in respect to the meaning of some of the terms here used, as the different import of solidity and hardness, we observe that Reid holds with Descartes that our notions of the primary qualities are *clear and distinct*, and of the secondary are *obscure and confused*, and with Descartes and Locke, that the *primary* give a knowledge of objects, *i. e.*, qualities *in themselves*, while the second gives us a knowledge of the unknown causes of subjective affections of the soul. Our knowledge of the first is therefore *direct*, of the second is *relative*.

§ 664. Dugald Stewart distinguishes the primary qualities into two classes, the *mathematical affections of matter*, which are *extension and figure*, and the proper primary qualities, which are *hardness, softness, roughness, and smoothness*. These two classes of primary qualities involve *extension and outness or externality*. The *secondary* are only the *unknown causes of known sensations*. When first apprehended by the mind they do not imply any thing distinct from the states of the soul. The unknown cause is afterwards, as in the case of color, so intimately associated with the subjective sensation, that the sensation itself is taken to involve extension, and it is impossible for us to believe that there can be sensations of color without perceived extension. *Phil. Essays*.

§ 665. Hamilton divides the qualities of matter into three classes, the *Primary, the Secundo-Primary, and the Secondary*. The *primary* include all the relations of matter to space, *i. e.*, the relations of extension. These may be stated under two general heads—the relations of matter as filling space, and as contained in space. Matter, as filling space, is extended in three dimensions and is incompressible. Matter, as contained in space, is capable of motion and place.

The primary qualities are simply *objective*, and though given on condition of sensation are percepts proper, gained by pure mental apprehension; no sensation or relation to sensation being involved in the notion which we form of them.

The *secundo-primary* are all comprehended under *Resistance or pressure*, and may be defined as the various capacities of Resistance. These are comprehended under the several heads of *Gravity and Cohesion, Repulsion and Inertia*. They are both objective and subjective. As objective they resist the locomotive energy, and are apprehended as resisting it in various degrees. As subjective they affect the sentient organism with various sensations of pressure. In the *secundo-primary* a sensation, *vis.*, of *pressure*, is the concomitant of the perception, *vis.*, of *resistance* to the locomotive energies. The term *hardness* denotes a resistance of which we are conscious, and a certain feeling from pressure on the organism. The former, a perception, is wholly different from the latter, a sensation.

The *secondary* are not properly qualities of body at all. We know only the several sensations and we infer some power in the body which produces them. These sensations, as consciously experienced, are, however, not purely subjective or spiritual states without extension, but affections of the sentient and animated organism, which is known in sensation to be extended. Each of these affections depends entirely on the excitement of the nervous organism from any stimulus, as electric action, congestion of the nerves, pressure or a blow; and the reference of it to any perceived body is purely inductive and experiential. The sensations to which these unknown or occult powers in bodies are supplied, are *Color, Sound, Flavor, Savor and Tactual sensation*, and all those which we have described as the *Muscular and Organic sensations*. The secondary qualities are powers inferred from sensation.

In respect to the relation of these three classes of attributes to the notion of matter, Hamilton asserts that the primary only are absolutely *essential* to the notion of matter, and these all rest upon the *a priori* and necessary idea of space, and can be deduced from it. The *secundo-primary* qualities, generalised as *Hardness* known through pressure, are not essential to the concept of matter. They are, moreover, known by observation and not deduced *a priori*. They are not, therefore, known as necessary but as contingent. They are not, therefore, essential to the notion of matter, though they are believed to be its invariable accompaniment. The secondary qualities are obviously *a fortiori* not essential to the conception of matter.

In critically estimating these theories by the aid of our analysis in §§ 650-660, we observe:

§ 666. 1. There is a general agreement in the opinion, that if there are any attributes of matter which are known directly by the mind, and which as known do not involve any relation to the sensations which attend them, these may be properly called *primary qualities*. If also there are powers in matter to produce sensations as effects in the soul as a sentient, these are secondary qualities.

The Primary and Secondary qualities distinguishable.

The principle of the division is obviously so just and the application of it so easy that the only question which we need ask is, Can these two classes of attributes be distinguished in fact?

The analysis already made has shown that they can. The relations of matter to space, in its double form of the space-limited and the space-filling, do not in their matter or content, as known by the mind, involve the recognition of any sensation. On the other hand, the powers of matter to produce certain sensations of touch, sight, smell, taste, and sound, can only be known by considering the sensations themselves as caused by these powers. Of the first class we have direct and positive knowledge. Of the second our knowledge is indirect and relative, it being explained by the effects.

The Secundo-Primary not satisfactorily established.

2. Is there now an intermediate or third class of material qualities, the secundo-primary, such as that for which Hamilton contends, in which the perceptual and sensational elements are both combined? We think that if there is, Hamilton has failed to show it by his analysis. The passage which gives the results of this analysis most briefly and clearly is the following: "The secundo-primary qualities have thus always two phases, both immediately apprehended. On their primary or objective phase they manifest themselves as degrees of resistance opposed to our locomotive energy; on their secondary or subjective phase, as modes of resistance or pressure affecting our sentient organism." *Reid's Works*, note D, p. 848.

Hamilton's locomotive energy.

The "locomotive energy" or "the locomotive faculty" is carefully distinguished by Hamilton (p. 864) from the muscular sense. He calls it the power of moving the muscles at will, and conceives that it might exist and act if all muscular feeling were abolished. In its actual exercise he analyzes its activities into three elements: 1. As a pure mental act of will = the *hyper-organic* volition to move. 2. As a mental effort or *nisus* to move = the *energanic* volition of which we are immediately conscious. 3. As the contraction of the muscles = the *organic* movement or the organic *nisus*.

Of this we observe, that this locomotive energy or faculty as known to itself by effort and degrees of resistance, is either purely spiritual or sensational or both. If it is purely mental, then the mind knows of a mental purpose and effort to move either something already known as objective, or its own organism known as such. If it be of something objective to the organism, then the degrees of its refusal to move must be measured either by the greater or smaller displacement or change of its space relations, in which case degrees of resistance would be estimated by objectively discerned changes in space-relations; or by some relation of the object to pure mental effort, in which case resistance in matter would be defined and conceived only by its relation to a purely mental effect, *vis.*, resistance to mental effort, which would involve a phase eminently subjective. If the object be the organism, then the resistance of the organism must be measured in the same way, on the supposition that all sensations are excluded.

If the locomotive energy is psychical and the resistance in its several degrees is sensational, then we have no longer a pure mental apprehension, either of objective relations of space or of relations to mental effort, but we estimate resistance by its relations to experienced sensations, which involves a subjective phase again in that which is claimed to be purely objective.

If the locomotive energy as exerted and resisted are both known as sensations, or are known by means of sensations, then the phenomena are purely subjective.

In general the power in matter to resist mental efforts can scarcely be considered as belonging to any class except the secondary qualities. The power to resist the locomotive energy is distinguished from the power to produce sensations, only by the kind of subjective effect which it produces. The one is no more objective than the other.

Matter as being, how related to the Primary qualities.

§ 667. There is still an element in matter which does not fall within either of the two classes of qualities, and which Hamilton seeks to provide for (unsuccessfully as we have seen), by the intermediate class. The conviction that there is material being forces itself upon every mind, and gives interest to the problem which in any way starts the question, 'What is that something?' *What then is it?* We reply, it is matter as being,

as distinguished from its relations to other matter, to the sentient spirit, or to space or time. This is known by direct "mental apprehension." It is known in connection with felt sensations and on condition of the excited or impelled sensorium. It is known as being and also as causing these sensations, not as though its being was only known through or by relation to these sensations, but it is directly known as being and also as related to these sensations which it causes. When it is not merely known as a percept, but is also defined as a concept, then by the very nature of the concept, it can be expressed and defined only by its relations or its attributes. (§ 662.) These give us logical knowledge. This does not include, nor can it stand in the place of the direct knowledge which perception alone can give, and imagination can revive. This can suggest what that would be and hence can in a most important sense recall and imply it. But the knowledge of matter of being is not included in it, it is only implied by the statement of its attributes. What the mind knows in its perception of matter can never be conveyed by an enumeration of the relations or attributes of what is thus known.

Two questions still remain.

§ 668. Two questions remain to be considered in respect to these two classes of qualities. (a.) Are the primary qualities distinguished from the secondary in being alone essential to the conception of matter, as Locke and others assert? (b.) Do the primary qualities alone give us a knowledge of matter as it really is, and as distinguished from a relative knowledge?

Are the primary qualities essential to the notion of matter?

In reply to the first, it is enough to say, that if we distinguish the concept or notion of matter from a percept or image, then all that is properly essential are those relations or qualities which are required to define and distinguish this kind of being from every other being. It is of course implied that such relations are always true of this kind of being; that they are always present and never absent in a single individual. This being assumed, we have only to ask for a sufficient number of relations to serve the purposes of definition. It is obvious that for this single object no other are necessary than the relations of matter to space. These are always present, and for the purposes of defining the concept these alone are required.

But this cannot be all that is intended by the phrase "essential to the notion of matter." This would suggest a question like this, 'Can matter, *i. e.*, the space-filling and space-contained being—possibly exist without some or all of the so-called sensible qualities, *viz.*, those of touch, color, smell, sound and taste? This question suggests its own answer, as follows: We cannot believe that matter is not tangible to a sentient endowed with touch, or visible, *i. e.*, colored to a sentient who can see. That matter is not visible to the blind is an unquestioned fact. But suppose he could see, and again suppose that the vision of those who do see were sufficiently acute to enable them to see the matter of gases, and the like! Whether there is or could be matter which is wholly divested of odor, or taste, or sound, to sentiments with the acutest conceivable capacities it would not be easy to decide, but it is quite certain that we can conceive (*i. e.*, imagine) it to exist without some of these qualities or relations to our own sensibility. If we employ the question in its more general meaning, we mean by "essential to the concept of matter"—"necessarily involved or implied in its nature or constitution." This would be the same as to ask, 'Can there be a permanently space-filling something which is not also tangible, visible, audible?' etc. But this is not a logical, or psychological, or even a metaphysical problem, but one that is purely physical—a problem which can be solved by extensive observations of every species of matter and a more penetrating insight into its powers and laws than has yet been reached. Its solution must be left with the physicists to whom it properly belongs.

Do they give a real knowledge.

§ 660. The second question is the following: Is it true, as Reid asserts, that our knowledge of the primary qualities only is a direct and real, while that of the secondary is only an indirect and relative knowledge of matter. In reply to this much agitated query, it seems clear that the knowledge of neither class of qualities as such, is real, as contrasted with relative knowledge. The knowledge of qualities of every sort is, as we have seen, only a knowledge of relations, and it consequently can only be relative knowledge. It is true the two classes of relations are different by reason of the beings to which they are related. The primary qualities are the relations of matter to time and space and the perceiving mind. The secondary and *secundo-primary* are its relations to the sentient soul. The first are discerned by the intellect only and do not require that any felt sensation should be introduced. The second require that the sensations, varying in quality and intensity with each individual at different times, should be considered. The primary are apprehended by a direct cognition, the mind looking out of itself at its objects. The secondary involve a reflex process by which the mind projects before its comparing judgment, the object, *viz.*, matter, and the subject, *viz.*, the sentient soul, or animated body, and asks and answers what are the relations of the one to the other. While then, both primary and secondary lie within the sphere of relations, and the knowledge of both is relative only, yet the objects related and the process by which they are cognised and compared is in the one case more complicated and unnatural than it is in the other. But both presume a real being which is both knowable and known as well as the relations of this being. If real knowledge is contrasted with, and is exclusive of, relative knowledge, then neither the primary nor the secondary qualities, when known as relations only, ensure us real knowledge. If direct and relative are opposed, we can only say that the knowledge by the primary is more direct than knowledge by the secondary.

The knowledge of qualities, whether primary or secondary, is not a knowledge of the reality but of the nature of existing things. It is, properly, not a knowledge that they are, but a knowledge of what they are. The primary qualities are, in one sense, more constant and universal, and hence more easily employed as signs or indications of what is fixed and permanent in the agencies, laws, and designs of existing objects, and hence they are safer than the secondary as indicators and criteria of what we call real knowledge. But the nature of real knowledge has been so much discussed in modern speculation as to require to be separately considered. As we are necessarily brought to consider this topic by the discussion of substance and attribute, we add the following:

VII. Of the real as opposed to the phenomenal.

§ 670. The *real*, in the language of recent philosophy, is opposed both to the *phenomenal* and the *relative*. It is used in the first connection by Kant, and in the second by Hamilton.

Phenomenal distinguished from the real in the first sense.

The phenomenal, as distinguished from the real, may be understood in two senses. It may mean that that which *appears to one sense is not what it appears to be* to another; as when a stick, thrust in the water, appears to be bent, but is not so in fact; or, when the rainbow appears to be, but is not, a solid arch, or the spectrum on the screen appears to be, but is not, a dagger or a flame. In cases like these, the object, as known by one sense, is misjudged (§ 146.) The inference is drawn that one percept, as that given to the eye, is the sign of another, that which is appropriate to the touch. We infer that what we see with the eye is, or will prove, solid, or, as we say, real, to the touch. We say of the stick in the water, it is apparently, but not really crooked, and of the stick in the atmosphere, with precisely the same appearance, it is not merely apparently but is really crooked. In this sense, that which is known by the sense of touch, or by all the senses combined, is held to be real, while what is apparent to or inferred from a single sense is phenomenal.

In the second sense.

The *phenomenal, in the second sense*, is any thing *manifested to direct observation*—either of sense or consciousness—as distinguished from *the elements into which it is resolved, and the powers or laws by which it is explained*. For example, the rainbow, as apprehended by the eye, is a phenomenon; but the rainbow, as resolved into light reflected from rain-drops at a certain angle from the sun, is said to be the reality. But what is a rain-drop? As a phenomenon it is an object with a certain form and appearance to the eye, with a certain taste, feeling, to the other senses, and with other relations to other well-known substances. But when it is chemically analyzed, it is known to be the product of certain agents in certain proportions. The reality of water would again be considered by some to be its chemical elements united in certain proportions; and the reality of light, an ether capable of certain undulations.

In the last sense nothing directly perceived is real.

According to this use of these contrasted terms, every thing apprehended by the senses, all that is known as most solid and real in the world of matter, is only phenomenal, and that only is real which is discovered by science of the elements and laws into which these phenomena are resolved, and by which they are explained. Any thing which remains to be thus explained and resolved, is phenomenal, relatively to the agents and laws which explain it.

The solid matter which we touch and press against is not real. The reality is the unknown something which we describe as endowed with the power to impart a special sensation through the nerves of touch. This special sensation with which we are so familiar is not real, but only the something which suffers changes (suppose vibrations), by which the mind is affected in a peculiar manner. Under this contrast, that which is directly and constantly known, which interests our feelings, which is most important, and, in one sense, is most permanent, is pronounced unreal; and that only is called real which is reached by special and artificial analysis, and expressed by recondite relations. Of the analysis which attains to reality so understood, we are never certain that we have reached the end. The real agents behind these shifting changes which we call the phenomenal universe of material being, may not yet

have been ascertained; and after all that science has discovered, we are still forced to ask, What is reality, and shall we ever be able to lay hold of it?

§ 671. In respect even to the mind that knows matter, we inquire whether, in case it were differently constituted, it would not give different phenomena; and whether what we call the sensible world is not a phenomenon made up in part of the unknown object which we call matter, and in part of the organized and animated matter which we call the sensorium, so that the objects touched and tasted and smelled and colored, etc., etc., which we call the material universe, are not realities, but only phenomena jointly produced by the two unknown and unknowable realities which we call matter and the embodied soul.

According to this contrast, the real thing, the thing in itself, can never be known. It is transcendental to our knowledge; we only know that it is. We cannot even know it in any relations; for the relations or categories by which the understanding judges, do not connect realities, but only phenomena. Even the relations of space and time do not apply to realities, but only to phenomena. And if both the forms of the understanding and of intuition, could be applied to things as well as to phenomena, these forms may themselves be only subjective, that is, the phenomenal products of the human agent having a relative existence only to the human being.

The real as thus opposed to the phenomenal is called by Kant the *noumenon* or the thing in itself. This cannot be discerned by the senses, nor can it be apprehended by consciousness. It ever flits from our grasp, and leaves phenomena only in our possession as shadows which do not satisfy us but point to something which we never can reach. We cannot know it by the intellect. It is true that the Speculative Reason, as distinguished from the Understanding, must assume it to exist, in order to regulate its operations and conclusions, but even the Speculative Reason does not know that it in fact exists. It is only the Practical or Moral Reason which commands us to believe that it exists in the three forms of Matter, the Soul, and God.

The doctrine of Hamilton on this subject has been made the subject of earnest dispute. Different interpreters are far from being agreed as to what was his real meaning. The following passages seem to express his views in intelligible language, and to exhaust all the constructions to which they can be subjected: "Our whole knowledge of mind and of matter is relative—conditioned—relatively conditioned. Of things absolutely or in themselves—be they external, be they internal—we know nothing or know them as incognizable; and become aware of their incomprehensible existence only as this is indirectly and accidentally revealed to us through certain qualities related to our faculties of knowledge, and which qualities, again, we cannot think as unconditioned, irrelative, existent in and of themselves. All that we know is therefore phenomenal—phenomenal of the unknown. The philosopher speculating on the worlds of matter and of mind, is thus, in a certain sort, only an ignorant admirer. In his contemplation of the universe, the philosopher indeed resembles Æneas contemplating the adumbrations on his shield; as it may equally be said of the sage as of the hero:

‘Miratur: Berum que ignarus imagine gaudet.’

Nor is this denied; for it has been commonly confessed, that as substances, we know not what is matter, and are ignorant of what is mind." *Discussions*, App. I. B.

"Our knowledge is relative: 1st, because existence is not cognisable absolutely and in itself, but only in special modes; 2d, because these modes can be known only if they stand in a certain relation to our faculties; and 3d, because the modes, thus relative to our faculties, are presented to and known by the mind only under modifications determined by these faculties themselves." *Met. Lec. 8.*

"Suppose that the total object of consciousness in perception is = 13; and suppose that the external reality contributes 6, the material sense 3, and the mind 3, this may enable you to form some rude conception of the nature of the object of perception." *Met. Lec. 23.*

"I believe that I immediately know a material world existing; in other words, I believe that the external reality itself is the object of which I am conscious in perception." *Dis. Rec. of Reid and Brown.*

"I have frequently asserted that in perception we are conscious of the external object immediately and in itself. This is the doctrine of Natural Realism. But in saying that a thing is known in itself, I do not mean that this object is known in its absolute existence, that is, out of relation to us. This is impossible, for our knowledge is only of the relative." *Dissertations on Reid*—(Note, p. 286.)

The assumptions of Kant and Hamilton criticised. § 672. We have already criticised the assumptions on which these conclusions of Kant and Hamilton are founded, and have directed attention to the misapplied analogies by which they have been derived. (§ 533.) We add only the remark that the word real, as at present contrasted with the phenomenal and the relative, is used comparatively only, so that an existence may be properly said to be more or less real, and that the words phenomenal and relative are also used in the same equivocal and variable manner. Philosophically or metaphysically considered, whatever is known is real, whether known to sense or consciousness, whether known to one sense or many senses, whether enduring for a moment or for an eternity, whether wrongly or rightly used as the ground for an inference. The thing *in itself*, or the thing *unrelated*, is a mere abstraction, and the real thus interpreted, is an imaginary phantom, an hypostasized abstraction which is transcendental and unreach-able to the human intellect, whenever that intellect vainly imagines that it may have substantial and separate being.

This search after the real as the ultimate and independent, is not confined to professed philosophers.

The same questions arise in common life. § 673. The course of thought by which these technical distinctions are evolved, and these refined speculations are occasioned, is natural to all men. The boy believes at first, that the rainbow which spans the sky is in reality a solid and colored arch. The savage thinks that the image of himself which is reflected in a mirror, is another human being who mocks his motions. But when the boy runs to touch the rainbow, he cannot find it; and when the savage looks behind the mirror, he cannot grasp the man he saw. This teaches them to distinguish between the real and the unreal. At first they call that real which can be handled as well as seen. When afterwards they learn to understand that these phenomena are effects, they dignify by the name of realities, the agents which produce them. By and by they conjecture that perhaps those appearances to the eye which are most permanent and constant, can be traced to certain forces on which they depend, and which are governed by laws. Having been surprised and mocked, as they think, more than once by sense-phenomena, they ask whether the universe that is painted to the eye, becomes any more real because it can be touched and grasped by the hand, than the rainbow which exists for the eye only, and is impalpable to the common touch? They persist in inquiring, if unreal visions of the eye can be so skilfully conjured into being by appropriate agencies, why also may not what is touched and weighed and measured be also as unreal, and be as dependent on forces and laws that are unobserved? If the sense-universe is 'what we half receive and half create,' why may not the mind itself, in all its knowing, be made a changing and relative factor by its own forms of sense and thought, and more than half create the phenomena which it seems to know? Nay, why may not the mind—the knowing agent—be itself a changing illusion, depending for being and laws on other agencies; itself the most unreal phenomenon of all, because productive of the most numerous unrealities?

How best resolved.

§ 674. We answer some of these questions thus: The question of reality and non-reality, as used in this special sense, is not concerned with phenomena as such, but with the causes, forces, or agents, which produce and explain them. The rainbow is as real—i. e., knowable—as are the clouds or the solid earth; and so is the image in the mirror as real as the man of whom it is the reflex. While each endures and is manifested to the sense to which it is appropriate, it is a reality. It is an illusion, in that the mind made more of it than it was authorized to do. If the boy had regarded it as only being visible, and had not run across the fields to find its golden pillars, he would not have complained of nature, or grown sceptical as to her trustworthiness.

We distinguish objects as perceived and as explained.

§ 675. To determine what is real, we must first inquire in what sense we use the word. We may distinguish between objects as perceived by sense, and as known in higher relations. Things and facts given in experience, are, as phenomena, just what they appear to be. But when we view them in their relations to causes and laws, we call those real whose causes are permanent and always active, for these are constant, ever-present, and enduring effects. If the causes are occasional and short lived, the effects are said to be unreal. The universal light and the wakeful eye coöperate to produce and prepare for the perceiving mind the reality which we call the visible universe. Let this light be dimmed, or the eye be dimmed (one or both), and the colored universe is an actual reality no longer. But inasmuch as its conditions or causes are ever ready to produce this phenomenal being, it is said to be real or a reality.

The relations of the intellect cannot be distrusted.

§ 676. But when we ask, May not the perceiving intellect produce the objects and relations which it beholds, as truly and with a similar liability to change as does the sensorium—i. e., Is it not with its categories, itself a phenomenon dependent upon transcendental and changeable forces? We answer, No. The analogy fails by which we transfer the phenomena of the *sentient* to the realities of the *knowing* soul. The soul, as intellect, not only acts in knowing according to the constitution which makes it what it is, but it assumes, and must assume, that these object-relations are discerned and affirmed by every intellect whether creating or created, and are therefore the real elements of all trustworthy knowing as a subjective process, and of all valid knowledge as an objective fact. To whatever object-matter this process or its results are applied (whether it be to material or spiritual, or to the thinking agent itself), these categories are absolute and real, and cannot be even supposed to be relative or phenomenal. To suppose them such, is to commit intellectual suicide. It is to introduce constant antagonism into every process which we perform, and the elements of self-destruction into every result which these processes evolve, as well as logical incompatibility and confusion into the language by which both processes and results are expressed. It is to philosophize ourselves into the impossibility of philosophy, and by assumptions which we deny that we may assume

It is not only to offend against reason by introducing inconsistency into that which in its very nature is self-consistent, but it is to overlook or deny those designs which we must assume that the universe exists to fulfil, so far at least as to be capable of *being known*.

CHAPTER VIII.

THE FINITE AND CONDITIONED.—THE INFINITE AND ABSOLUTE.

THE questions concerning the finite and its relations, the conditioned and its dependence upon the absolute, are the most vexed and the most unsettled of any in modern speculation. Can the infinite be conceived or known by a finite intellect? Can the unconditioned be brought under those relations which are appropriate only to the conditioned? What are the finite and the infinite—the conditioned and the absolute? These inquiries, and such as these, are discussed in various forms and phrases in all modern treatises and histories of philosophy. They force themselves into psychology as they compel us to inquire: By what powers and processes of the intellect do we form, or essay to form, conceptions of these objects? Do we believe that such objects exist? Who and what are time, space, and God? Do we only *believe* them to exist? If so, by what process and on what grounds? Is it a process of intuition, knowledge, or faith? What relations do they hold to one another? Are time and space infinite in every sense in which God is infinite? These questions we must attempt to answer, if we would analyze all the powers and explain all the products of the human intellect. We can do this most successfully if we consider the finite and the conditioned apart from the infinite and the absolute. We begin with

I. *The finite and the conditioned.*

To know a limiting process.

§ 677. The process of knowledge in all the forms as yet considered, is a unifying and therefore a *limiting* process. It is true it also divides; but the intellect discriminates, in order that it may combine; it divides, in order again to unite. But its final achievement is to effect some union. It is to make one, of materials which were separate or diverse. Each object which it takes in hand it analyzes into many parts, and discriminates into various elements. The parts it then proceeds to recombine into a completed whole: the elements it blends into a perfected product. It leaves it a completed whole or finished result, which passes into the sum of its possessions as a known, a defined, and therefore a limited or finite object.

Illustrated by sense-perception.

Thus, in sense-perception, the objects are perceived by being first separated into distinct percepts, each of which is perfected by a separate act of analytic attention, and again united into a completed whole in space. These wholes are separated from the perceiving mind as diverse in nature, and yet are connected by the uniting act of knowledge, as existing in a single instant of time.

These single objects, so called, thus distinguished from one another in space, are connected with one another as adjoining, and thus of these several distinguishable things, is made up a continuous unit, comprehending all the parts at once presented to the eye or covered by the hand. The distinguishable parts of an act or state of the mind are united as co-existent, and so connected into a whole by the observation of consciousness.

The units thus constituted may be enlarged by the imagination and memory.

By acts of imagination and memory.

Spatial objects may be added one to another, so as to increase the space-unit to the furthest limit; or imagination may suppose them created when they are not. Memory may add to the present mental states all that have gone before within its own experience. Imagination supplies all that now exist, or that may exist in other minds. Each of these forms of the representative power, after its own manner produces units or finite wholes.

By the processes of thought.

Thought, by its similarities observed, unites the like into new combinations or units. It refers diverse effects to a common cause, acting under similar laws. It subordinates means the most diverse to a single end, by their conspiring and designed adaptation, and thus unites them as preëminently one.

The finite universe; how conceived.

§ 678. We can imagine that all material objects perceivable could be united as one by the single mind with capacities ample enough to grasp so many by a single act. What no human mind can actually perceive or be conscious of, it imagines under the relations of time and space, and by induction believes to exist. It can also imagine every existing mind as operating with every other mind, and can suppose itself to know all the powers of these minds, and all their acts. We can believe it possible that these agents and objects should be known in all their knowable likenesses and dissimilarities, in all their causal agencies, in all the laws under which their forces act and the ends to which they are adapted. We can conceive this assemblage of separate objects, material and spiritual, with their several phenomena, to be but an assemblage of effects, produced by other agencies and other beings in previous times, and these by others; each aggregate of beings and forces producing others, under permanent agencies and fixed laws. Moreover, we can conceive these beings, with their powers and laws, as co-existing in space; these successive evolutions, whether of separate beings or new phenomena, as developed in time, as designed for separate ends, and all these ends as conspiring together for a series of ends, constituting in this way an intelligible and orderly system. This assemblage of all objects believed to be existing in space and acting in time, with all the agencies and laws and relations now known or which may be afterward discovered, make up the *finite universe* as knowable, or conceived by man. It is called the *universe*, because it includes as a whole all the separable objects apprehensible by sense and consciousness. It is the finite universe, because each of these objects is limited to a portion of space and a period of time, and subjected to all the conditions of existence and of action which their actual forces, laws, and ends prescribe. It exists and acts under the action of these forces, ends, and laws.

What it is to know the universe.

To know the finite universe, in its constituent parts, and to unite these under all known and discoverable relations, is the aim of science. To this end it observes facts, viz., objects and their phenomena; searches out causes, interprets laws and uses, and is ever nearing but has not yet achieved its ideal of mastering every thing that can be known. It conceives of all that exists, or has existed, or that may exist, and it seeks to make of this universe of fact, a *universe known*—i. e., a *universe of finished or completed knowledge*.

The finite universe is limited.

§ 679. To speak more exactly, the finite universe is both *limited* and *conditioned*; the words limited and conditioned not being always synonymous. The universe of objects and events which we know by sense-perception, and which we enlarge by the representative power, believing that its objects exist by means of thought; this universe is made up of objects and events which are bounded by one another, and have a limited or definite extension. This is true of all the existing spirits which we know. They all exist and act within certain defined spheres of extension. When all these extended beings, and these spheres of spiritual being and action, are gathered into the universe known, its extension is still limited or defined. So far, also, as we trace this universe of beings and phenomena, backward or forward through the series of its changing developments, its duration is limited by a beginning and end. There is a *first* and a *last* of the series, if it is limited; whether the terms designate a single object or act, or are collective and designate many objects.

It is also conditioned.

It is also a *conditioned universe*. Every part and element in it *depends* on something other than itself, for what it is and for what it does. It begins to be by the operation of one or more agents acting according to laws, and these agents are the necessary conditions of its existence. It also continues to exist under the operation of *conditions*. These conditions are the causes, laws, and ends of its being, and these prescribe its being, as well as the sphere and the results of its activity. Each part of the universe being thus dependent on productive forces other than itself, the universe itself, as a whole, is said to be conditioned as well as limited. But is this all that we know? Is this all that exists? Besides the limited, is there the unlimited? Besides the conditioned and dependent, is there the unconditioned, the self-existent, and self-active? These questions introduce

II. *The infinite and absolute, and their relations to the finite and dependent.*

The import of the terms must be considered.

§ 680. To understand the import of the questions concerning these much-vexed topics, and to attempt to answer them, it is necessary, first of all, to clear away all uncertainty in respect to the terms which are employed, and to bring the mind to a definite apprehension of the various senses in which they may be interchanged and confounded. The vagueness in which terms of such extreme

abstractness are susceptible, and the consequent ambiguity with which they are used by different writers and even by the same writers at different times, are fruitful sources of misunderstanding and controversy: to say nothing of the general haziness and uncertainty which invest the subject in many minds. It may contribute somewhat to the removal of these evils, if we consider, *first* of all, the etymology of the more important of these terms.

We begin with the *infinite*.

The signification
of the infinite.

§ 681. *Infinite* signifies, literally, that which is not bounded or terminated. It is primarily applied to spatial quantity.

Every thing which has extent is terminated or bounded by some other object or objects which are also extended. The line or surface which divides one surface or solid from another, is called its *limit*, and the surface or solid, as necessarily thus terminated or terminable, is called *finite* or *limited*. In like manner, the mathematical point is conceived as terminating or limiting the mathematical line, and the line itself is limited or finite. By an obvious transference of signification from the objects of space to those of time, the first and last of any succession of events or series of numbers is called its limit, and every series of numbers, numbered objects, or events and portions of time, is *finite* or *limited*.

Transferred
from quantity to
power.

The terms originally appropriate to extension, duration, and number, are still further applied to the exercise of power by material and spiritual agents. The exercise of power by man, whether spiritual or material, is possible only in certain places, at certain times, and with respect to a certain number of objects, or a measured quantity or mass of matter, and thus power itself becomes measurable by the relations of quantity and number as applied to its effects and the means by which they are caused. Man can only accomplish certain effects in *limited* places, times, and number, and hence he is said to be limited in his powers. He can only know and do certain things under all these favoring circumstances, and is therefore a *finite* being. The word *finite* is, therefore, *originally a term of quantity*, and *secondarily of causal or productive agency*. The *infinite*, in the general sense, is the *not-finite*. Logically conceivable, there are as many sorts of the not-finite or infinite as there are senses of the finite.

As many senses
of the infinite as
of the finite.

We may attach the negative particle to every positive adjective, and form a corresponding negative conception. Whether each of these concepts is realized in fact—i. e., whether there is an existing reality corresponding to the concept thus constructed—is a question which is not so easily answered. But that with which we have to do at present, is the possible senses or meanings of the term; and it is obvious that there may be as many of these senses as there are possible senses of the finite, its logical opposite. As there is the concept of finite in the sense of quantity, so there is the infinite of quantity; and as there is the finite pertaining to causal agency in matter and spirit, so there is the concept of the infinite in the same sense. It is most important to keep

this fact in mind, and sometimes to ask distinctly of ourselves, or others, in which sense the term infinite is used.

§ 682. *The unconditioned* comes next in order. Logically it is the negative of the conditioned, and follows its meaning. *The conditioned* is that which is in any sense *dependent* upon any thing else, either as a *material* of its composition, a *cause* or *means* of its production, or an *object* of its psychical activity. Thus, silver is a condition of a silver spoon; heat is the condition of the melting of iron; and a material world the condition of the act of sense-perception. Every condition has this in common with every other, viz., that that to which it is the condition cannot be what it is without it, whether it is a thing, an act, or an effect. It is therefore said to be limited by these conditions. It can neither be, nor be thought of without them. They are necessary to it. They must be given or present with it, and are therefore called its conditions.

§ 683. The *primary* signification of the conditioned is that of *necessary dependence*. Its *secondary* application is to objects of quantity, thus reversing the process through which the *finite* passes. The *finite* proceeds from a signification of *quantity* to one of *quality*. The conditioned proceeds from *quality* to *quantity*.

The line and surface are the conditions as well as the limits respectively of the surface and the solid, but solely because they are essentially necessary to the conception of each. In the same manner, space and time are the conditions of extension and duration, because they are essential to the possibility of each. They can neither be logically thought of, nor really exist, except as they involve space and time as their conditions. All the limits of objects of quantity are also their conditions, but all the conditions of such objects are not necessarily their limits. The *finite*, in its *secondary* signification, coincides in its application with the *conditioned* in its *primary* meaning. The conditioned, in its secondary meaning, may be applied to the same objects with the finite in its primary meaning, but not to the same relations of these objects.

The *unconditioned* is that which is *not conditioned*—i. e., not necessarily dependent on other objects for thought, being, or act, as a constituent, cause, or object. Whenever the positive can be applied, the negative can be logically conceived as the opposite of the conditioned.

There is a special sense in which these terms are employed by *Hamilton*, which gives them a wider signification and a more extended application. This writer, with *Mansel*, defines to *condition*, by to *think*, and thus makes it the equivalent of; to know objects as related, or in a relation. According to this definition, every object which is related to any other, is *conditioned* by that object, and the *conditioned* is equivalent to the *related*. The unconditioned, in this sense, is equivalent to the unrelated; and if the infinite is equivalent to the unconditioned, then the infinite must be incapable of being related. This is not the signification which we have attached to either of

these terms. It is not necessary to find this meaning for them, in order to define them. Whether Hamilton's definition is correct, will be discussed hereafter.

§ 684. *The absolute* is still another term which is often interchanged with the infinite and the unconditioned. Originally and etymologically, it signifies *freed from*, or severed. This signification is purely negative, and waits to be explained by that from which it is freed. Thus it was applied, to mean *the finished or completed*, even as the Latin word *absolutus*, as is thought, was originally used of the web when ready to be taken from the loom. Both these senses have passed into the modern uses of the term, and determined the varieties of its application. *First* of all, absolute and absolutely is applied to any thought or thing as viewed apart from any of its relations—regarded simply by itself. This meaning is near akin to that under which it is viewed as *complete within or by itself*. *Next*, it is applied to that which is complete of itself so far as the relations of *dependence* are concerned; to that which is necessarily dependent on nothing besides itself. In this sense it is very near in meaning to the *primary* sense of the *unconditioned* already explained. *Still further* it is used in the sense of severed or separated from all relations whatever, or *not related*—i. e., not admitting of any relations. This sense is the same with that which Hamilton and Mansel give to the unconditioned and the infinite. *Still again*: it is applied to relations of *quantity*, and here the signification of *complete* or *finished* is applied to the greatest possible or conceivable whole, to *the total* of all existence, whether limited or unlimited in extent and duration.

The Hegelian sense. In the Hegelian terminology, the absolute takes a special signification from the fundamental assumptions of the Hegelian system. When the notion, *der Begriff*, has completed every possible form of development, and, as it were, done its utmost possible by the force of the movement essential to itself, the absolute is reached. This absolute completes every possible form of development, and represents every kind of object conceivable and knowable by the mind, from the undetermined notion with which it begins, up to the highest form of development, when it becomes self-conscious in the human spirit by distinguishing itself from the material universe. The conscious spirit thus evolved, and reflecting in itself all these lower forms of existence, is, with these forms, *the absolute*. This is perpetually reproduced by the lower forces of the universe, and itself perpetually reproduces all these by its own reflective thinking.

§ 685. Again: these three terms are all used in two applications, which are often interchanged, but which should be carefully and sharply distinguished. The infinite, the unconditioned, and absolute, may denote some property or relation of a being *in the abstract*, or may stand for a being or entity which is believed or supposed to be infinite, unconditioned, or absolute. That is, the infinite, etc., may stand for the infinitude, the unconditionedness, the absoluteness of some being—i. e., as an *abstractum* or property of a being; or for that which is infinite, unconditioned, or absolute. One of these acceptations

is obviously very different from the other. The one may readily be confounded with the other.

The sense in question should be exactly known.

It is of the greatest importance that the sense in which the word is used in any inquiry or discussion should be distinctly settled, and kept uniformly and steadily before the mind. It is so for two reasons: *First*, these terms are in their nature so vague and abstract, that the danger is very great that one of these senses will not be distinguished from the other; and *second*, the problem to be solved with respect to the terms, changes with every change in their acceptation. If they are used only in the sense of *abstracta*, then the question to be answered is, Can they be conceived by the mind? Is it possible for the finite human intellect to form a concept of the infinite, the unconditioned, the absolute? or, which is the same, Can the finite think the infinite? If these terms are used as the names of an actual being, then the problem is, Does the human mind know or believe that that which is called the infinite, the unconditioned, and the absolute, does actually exist? If it believes or knows this, by what process does it know it, and upon what evidence or grounds? And again, Can it believe this infinite to exist, without also conceiving it or forming a concept of it? All these questions have been raised with respect to the infinite and the absolute. One of them is often interchanged with another. Some times they are blended together, and the result has been great confusion of thought and endless wrangling; or despair of reaching a solution of any of these questions, or gaining any satisfaction in respect to the subject to which they relate.

The absolute, etc., not negative conceptions.

§ 686. These distinctions being premised, we observe still further, that these concepts and the entities which they represent are not of necessity merely *negative conceptions*, nor are they the products of what is called negative thinking.

We have seen from our analysis of the terms *infinite*, *unconditioned*, and *absolute*, that they are all originally negative in form, and that this form, strictly interpreted, would denote the absence or the denial of the positive attributes, with which these negatives are combined. From this unquestioned fact the inference has been derived that, because the terms were negative, the concepts are also negative.

Arguments of Hamilton and others.

Locke gives some countenance to this view (*Essay*, B. II. c. xvii. §§ 13, 16, 18. Cf. Leibnitz, *Nouv. Mss.* B. II. c. xvii.), but he does not push it to its extreme. It was reserved for Hamilton to do this in the affirmation that the unconditioned, both as absolute and infinite, are not only direct negatives of the *progressive* and the *limited* but of that which is in any way thinkable. "The notion of either unconditioned is negative, the absolute and the infinite can each only be conceived as a negation of the thinkable. In other words, of the absolute and infinite we have no conception at all." * * "Correlatives certainly suggest each other, but correlatives may or may not be equally real and positive. * * Thus every positive notion (the concept of a thing by what it is) suggests a negative notion (the concept of a thing by what it is not); and the highest positive notion, the notion of the conceivable, is not without its corresponding negative in the notion of the inconceivable. But though these mutually suggest each other, the positive alone is real; the negative is only an abstraction of the other, and in the highest generality, even an abstraction of thought itself."—*Discussions, Review of Cousin*. 'Kant ought to have shown that the unconditioned' "is self contradictory, because it is not a notion, either simple or positive, but only a *fasciculus of negations*—negations of the conditioned in its opposite extremes, and bound together by the aid of language and their common character of incomprehensibility."—*Met. Lec.* 38. Cf. *Calderswood*, chap. II. v. Also, *Mill, Rev. of Ham. Philosophy*, c. iv. In these passages Hamilton would seem to concede that it does not necessarily follow that because a term is negative, the concept which it denotes must of course be negative, but he argues as though this were true.

But this inference, by whomsoever it is countenanced or made, is manifestly invalid. It does not follow, because a concept is designated by a negative term, that it is not positively conceived; or, because an object is called by such a name, that it is not really known. If the only fact that is prominent before the mind be that an object is not something else—whether it be a being or a quality—it may be designated by a negative term. This term does not deny its real existence, or that it is both knowable and known, for it may assume and imply both. It simply sets forth its contrast with something else. If we see a bat, and say of it, It is not a bird, or, It is not a beast, or if the Sandwich Islanders, for lack of name, had called the *ox* a *not-hog*, the use of a negative appellation would not necessarily authorize the inference of a want of definite conceptions or positive knowledge. So, when we gather together the entire sphere of finite being, and, stretching our thought beyond, apprehend something which is unlike it and contrasted with it by being *not finite*, *not conditioned*, and *not dependent*; we do not confess that we cannot conceive it or that we do not know it as something positive and real because we emphasize this single relation of contrast by the use of such negative terms as the infinite, the unconditioned, and the absolute (*i. e.*, the not finitely related).

The arguments
not valid.

§ 687. Again, these concepts are not "negative," in that they are produced by what is called "*negative thinking*."

This negative thinking is distinguished from the mere thinking of a negative—*i. e.*, thinking a positive in a negative relation—as above explained. According to this theory, our conceptions of the unconditioned, etc., are necessarily negative, because they are the result of an attempt to think them which is unsuccessful, and which, whenever it is repeated, reminds us of the impotence or imbecility of our faculties.

Arguments of
Hamilton and
Mansel.

"Every thing conceivable in thought lies between two extremes, which, as contradictory of each other, cannot both be true, but of which, as mutual contradictions, one must." "Space cannot be conceived by us either as an *infinite* or a *finite maximum*, or an *infinite* or *finite minimum*, and yet if it is conceived at all it must be conceived as one of these, and forasmuch as we cannot conceive it under either, we have only a negative idea of space, *i. e.*, an idea which results from an impotent attempt to conceive it. The same is true of time, and even of causation itself."—Hamilton, *Met. Lec.* 38. Mansel illustrates the process of negative thinking still more definitely. "A negative concept, on the other hand, which is no concept at all, is the attempt to realize in thought those combinations of attributes of which no corresponding intuition is possible." "The only negative ideas with which the logician or metaphysician as such is concerned, are those which arise from an attempt to transcend the conditions of all human thought." * * "Such negative notions, however, must not be confounded with the absence of all mental activity. They imply at once an attempt to think and a failure in that attempt."—Mansel, *Proleg. Logica*, chap. I. Both Hamilton and Mansel concede that there is a belief of the reality of this something which we cannot succeed in thinking or knowing. "We are thus taught the salutary lesson that the capacity of thought is not to be constituted into the measure of existence, and are warned from recognising the domain of our knowledge as necessarily coextensive with the horizon of our faith; and by a wonderful revelation we are thus, in the very consciousness of our inability to conceive aught above the relative and the finite, inspired with a belief in the existence of something unconditioned beyond the sphere of all comprehensible reality."—Hamilton, *Dis. Rev. of Cousin*. Mansel says: "We are compelled by the constitution of our minds, to believe in the existence of an Absolute and Infinite Being—a belief which appears forced upon us, as the complement of our consciousness of the relative and finite."—*Limits of Rel. Thought*, Lec. 2.

Their conclusions
untenable.

When these statements are closely scrutinized, it will be seen that this so-called negative thinking is simply a peculiar method of knowing or believing, which is unlike, and so the negative of, another particular way of knowing or believing. That the absolute is believed to exist, is affirmed by both Mansel and Hamilton, as

well as by Kant. They contend that it is not known under the limitations or relations which are appropriate to *thought*. Let this be allowed; it does not prove that what is known is therefore *negatively known*, or that the process by which it is known is a *process of negative thinking*.

The absolute,
etc., not unrelat-
ed.

§ 688. The unconditioned, etc., is not necessarily, as a concept or as a being, *exclusive of all relations*. It is not *unrelated*, or *the unrelated*.

Argument of
Spinoza, etc.

This was the doctrine of Spinoza. The comprehensive maxim on which he rested for the statement and defence of it was *Omnis determinatio est negatio*. Every relation implies a distinction into parts related; the one part cannot be the other: hence, the absolute, as related, cannot be complete or perfect of itself. It cannot be *unconditioned*, for, in order to be related, it must require, or, so far as related must be conditioned upon, that which is not itself to which it is related. It cannot be *unlimited*, for, in order to be what it is, or what it is asserted to be in the given relation, it must depend on something out of itself. The unconditioned cannot, therefore, be related. Hamilton gives the following reasons for the same opinion: "A relation is always a *particular* point of view; consequently, the things thought as relative and correlative are always thought restrictively, in so far as the thought of the one discriminates and excludes the other and likewise all things not conceived in the same special or relative point of view." And again: "We conceive God as in the relation of Creator; and in so far as we merely conceive Him as Creator, we do not conceive Him as *unconditioned, as infinite*," etc. (*Letter to Calderwood, et Mansel, Limits of Rel. Thought, Lec. 2.*)

Reply.

The proper answer to these representations is the following: It is not at all essential to the conception of the absolute which the human mind requires, or to its reality, that it should exclude all relations, but only a certain class of relations, viz., those of *dependent being* or *origination*. The truly absolute and infinite is that which is not dependent on any other being for its existence or its activity. It is no part of its perfection, that it should not be distinguished in thought from that which it is not in fact; nor that it should not be compared with objects not itself, under the various relations of likeness, difference, production, and design, but simply that it should not hold certain special relations to all such objects, viz., the relations of dependence. These relations imply a certain species of limitation which is incompatible with absoluteness or unconditionedness. The existence of those relations is not inconsistent with, but is rather essential to its completeness and independence.

The absolute,
etc., not the total
of being.

§ 689. The unconditioned, etc., is *not the sum of all actual or conceivable being*.

This view of the absolute is closely connected with the preceding. The denial of all relations to the absolute involves the denial of all parts or entities, whether real or thought-parts, which can be related, and this requires the conception of the absolute, as the total of all existences and conceivable things, the *Tò & καὶ Παν*, *the all which is also one*.

This position was actually taken by *Spinoza*, who was driven by logical consistency to acknowledge but one being or substance in the universe.

Hamilton (*Letter to Calderwood*) reasons as though this were the only possible conception of the true absolute. Mansel, (*Limits of Rel. Thought*, Lec. 2,) expressly asserts: "That which is conceived as absolute and infinite must be conceived as containing within itself the sum not only of all actual, but of all possible modes of being. For, if any actual mode can be denied of it, it is related to that mode, and limited by it." "The metaphysical representation of the Deity, as absolute and infinite, must necessarily, as the profoundest metaphysicians have acknowledged, amount to nothing else than the sum of all reality."

This view not required.

Of this view of the absolute we need only say, that it is not the only possible conception, nor is it the most rational conception which can be taken of it. In a gross quantitative sense, we may say that the finite, plus the so-called infinite, equals the absolute, and that the result is in conception and in fact the unconditioned and the infinite, because nothing can be affirmed of it in the way of distinction or relation. But the question at once returns, Is this the absolute and the unconditioned which the mind necessarily receives in thought and believes in fact? This absolute cannot be totality, for it is expressly supplied by the mind in addition to the finite. It is required by the mind, in order to account for and explain it. It cannot be that or require that which it itself accounts for and explains.

The total of finite being not infinite.

There is a sense of the absolute which is equivalent to the whole of the finite in its several parts, with all their possible relations, including all the capacities of development which are possible under the conditions of space and time.

This is, in fact, no infinite or absolute at all, in the sense in which it is required by the mind, but only the substitution in its place of the largest and most extensive quantitative concept which the finite can permit. The dependence is that of each part upon all the others, these others being, in like manner, dependent upon the whole combined, while the absolute, in this sense, rises above a mere sum of parts, and becomes another expression for the finite universe, viewed as an organic whole, and subject to necessary processes of growth and development. Whether these processes may go on indefinitely, each preparing the way for that which should follow; or whether, after having accomplished a cycle, they return upon one another, repeating themselves as they return, the conception of the absolute is the same, viz., the whole of finite beings with limited capacities and dependences. Those who seek the infinite and the unconditioned in this conception, substitute the finite for the true infinite. They interchange a completed or a completable finite, which they call the absolute, for that which is above all finite conditions.

The absolute not a matter of quantity. The proper absolute.

Unconditioned and *infinite* cannot pertain to the relations of *quantity*. Quantity, as we have already shown, is, in its essential nature, measurable and definite. However large may be its continuous extent, as in spatial extension, or however great may be its sum, as in discrete number, it is in its nature finite. The space and time which make extension and duration possible, are not themselves

quantities, but the conditions of quantity. They are not subject to *real* relations, but they render these relations possible.

The absolute,
etc., not devoid
of interior rela-
tions.

§ 690. The absolute, again, is not a concept or entity which is divested of all *interior relations*—a something *entirely one and simple*.

Those who contend that the absolute does not admit the idea of parts, because parts imply division and relationship, are driven by a logical necessity to the conclusion that it must be one and indivisible in parts and relations. Hence it has been inferred that the absolute cannot be a personal being. A person distinguishes himself from that which is not himself, his own being from his acts, and both from their objects, whether these be real or spiritual. His acts must be successive to one another also, and thus be separable and distinguishable in time. All these divisible parts and distinguishable relations are, it is urged, entirely incompatible with the concept and reality of the absolute.

These views are held by those who deny the possibility of personality in God, as well as by those who, like *Kant*, *Mansel*, and *Hamilton*, believe that God is personal, but deny that, when conceived as personal, He can be known as an absolute Being.

It is enough to say of this view of the absolute, as has been said already, that the absolute does not necessarily exclude the possibility of parts or relations. The absence of necessary dependence upon the finite and the complete dependence of the infinite upon itself, does not imply such a simplicity or oneness of being, as excludes complexity or personality.

The absolute,
etc., are know-
able.

§ 691. Having defined what the *absolute is not*, we proceed next to assert that the absolute and the infinite *is knowable by a finite mind*. Not only can such a mind know *that it is*, but it can know *what it is*.

Views of Kant,
Hamilton, and
Mansel.

Kant, *Hamilton*, and *Mansel* all hold that we cannot know, though we may believe that the infinite exists, simply because the conception of the infinite is not within the grasp of the finite. *Kant* teaches that the reason why we cannot know the infinite, is, that our faculties of knowing both the finite and the infinite have merely a subjective necessity and validity, and therefore we cannot trust these results as objectively true. Moreover, if we apply them to the infinite, we are involved in perpetual *antinomies* or *contradictions*. Our only apprehension of the absolute is, therefore, by the practical reason, and comes in the way of a moral necessity through the categorical imperative, which requires us to receive certain verities as true. *Jacobi*, *Schleiermacher*, and others say, that we reach these by faith or feeling, and not by knowledge. *Hamilton* says that we find ourselves impotent to know them, in consequence of the contradictions which the attempt involves. But he expressly asserts "that the sphere of our belief is much more extensive than the sphere of our knowledge; and therefore, when I deny that the infinite can by us be *known*, I am far from denying that by us it is, *must*, and *ought* to be believed. This I have indeed anxiously evinced, both by reasoning and authority." (*Letter to Calderwood*.) "Thus, by a wonderful revelation, we are thus in the consciousness of our inability to conceive aught above the relative and finite, inspired with the belief in the existence of something unconditioned, beyond the sphere of all comprehensible reality." (*Rev. of Cousin*.) It will be noticed, that what *Hamilton* teaches here is not that the absolute cannot be adequately known, but that it cannot be known at all, because it cannot be conceived. A similar doctrine

was taught by *Peter Browne* in his *Procedures and Limits of the Human Understanding, and Things Divine and Supernatural, etc.*

Of this view, by whomsoever it may be held, it is enough to say, at this point, that it is impossible to conceive of an act of faith or belief which does not include the element of knowledge. Faith, or belief, may exclude definite knowledge, reasoned knowledge, etc., but it cannot exclude some kind of intellectual apprehension. But of this more will be said hereafter.

Herbert Spencer dissents from these. *Herbert Spencer reasons against Hamilton and Mansel, to the conclusion that we can know that the Infinite exists, but we cannot know what it is. He contends that we can know that it is, because, "To say that we cannot know the Absolute is, by implication, to affirm that there is an Absolute. In the very denial of our power to know what the Absolute is, there lies hidden the assumption that it is, etc. Besides that definite consciousness of which logic formulates the laws, there is also an indefinite consciousness which cannot be formulated."*—*First Principles*, P. I. c. iv. § 26. Spencer, it should be observed, contends that we cannot know what it is on the grounds urged by Kant and Hamilton, viz., that knowledge, or as he would term it, *formulated knowledge*, is cognizant of the finite alone. He does not explain why, in assuming that the Absolute is, we are not compelled to know, in some sense, what it is; why, in the indefinite consciousness out of which the definite consciousness is evolved or formulated, there is not necessarily implied that the one bears some relation to the other.

It deserves to be noticed, that what Spencer claims for knowledge he denies to faith. Indeed, he shuts the door forever upon all trustworthy knowledge of the Absolute. All our conceptions of the what must, in his view, be forever inadequate. They are simply the best symbols which we can shape concerning it, the growth of our individual development or of that of our age; concerning which we can only know that while one is better than another, they are all necessarily false, because certain to be outgrown and laid aside. It would seem that a writer who affirms this so positively of the Infinite, and of the capacities of the human race to know it for all future time, must have, somehow, *formulated* the knowledge that he expresses so positively.

Hobbes on the Infinite. It is curious to notice that Hobbes makes the same distinction between the knowledge *that* and the knowledge *what*, though not in precisely the same meaning. "And forasmuch as God Almighty is incomprehensible, it followeth that we can have no conception or image of the Deity; and consequently all his Attributes signify our inability and defect of Power to conceive any thing concerning his nature, and not any conception of the same, except only this, that there is a God: For the effects we acknowledge naturally, do include a power of their producing, before they were produced; and that Power presupposeth something existent that hath such power," etc. "And thus all that will consider may know *that* God is, though not *what* he is."—*Of Human Nature*, chap. 11.

We observe that Hobbes must mean by a knowledge of the *what*, a complete and defined knowledge, for he says that there is one *what* which we do know of God, viz., that he is the *producer* of all things.

The absolute cannot be known by the imagination. § 692. Against these views, we contend that the absolute is knowable—that man can both know *that* it is and *what* it is.

But, first of all, we would define the sense in which it *cannot be known*, either as *that* or *what*.

(a.) It cannot be known by the *imagination*, either as representative or creative. The imagination can only picture that which is limited by space and time, and which is possessed of limited powers of matter or spirit. The absolute and infinite is not spatial or enduring, and has not the attributes of matter or spirit, as limited by space and time. It cannot, therefore, be either imaged or pictured. It can only be known as related to that which is in time and space, which is material and spiritual, etc. A relation cannot be imaged, though related finite objects can be. While, therefore, it is necessary to use the imagination in order to know the absolute, because it pictures the finite objects which suppose and require the infinite and abso-

lute, the imagination cannot picture the absolute itself—i. e., in any proper or useful sense.

The proposition qualified. It would be more exact to say that the analogies between any finite objects and the infinite are so general and attenuated, that the imagination can render no available or efficient service by introducing the images of the finite. It is true that, if we can know *what* the absolute is, we can form some notion of it, and this we can do only by means of some relation which it holds to the finite. It is true, also, that every relation, however general, can be imaged or illustrated by some finite object in which it is exemplified. In other words, the infinite, to be known as a *what*, must be known in some points of likeness to the finite; but the likeness may be so very general, and the unlikenesses or differences so numerous and striking, that the attempt to image the one by the other will fail to produce the advantages which commonly accrue from the process, while the finite image will suggest so many misleading and bewildering associations, as to embarrass and confuse the mind. (§ 371.)

This explains why such writers as Bishop Brown, who has been followed by Whately and others, contend that, while there is no proper similarity, there is an analogy between the finite and the infinite, or the human and the divine. The alleged analogy, it is obvious, is only a more general similarity, which, so far as it goes, allows of classification and inference, but which we are exceedingly liable to mistake and overestimate. Thus interpreted, their doctrine, and the cautions which it embodies, is true and salutary, and needs to be continually brought to mind.

Thus, the *absolute*, if it be any thing, is a being or entity in the largest sense of the term; that is, it is like every finite being in this one respect, that it *is*. But it is of no avail to image so vague and general a notion as this by any finite being. But again, it is, as we shall see, that on which every finite being, and the finite universe as a whole, depend for their existence, and their power to act. The general relation of dependence holds between one finite object and another, in the several forms of *cause*, *reason*, and *constituent*.

Why of no use to image the absolute. But to image the relation of dependence which exists between the infinite and the finite by the special and limited examples of it, such as exist between different limited beings, is either superfluous or misleading. The relation may be known as so general, like that of simple entity, as not to need an example; or the use of an example introduces many extraneous and unimportant circumstances, which are yet conceived as essential to the relation in question. Thus, when it is reasoned that self-existence, personality, the creation of another than itself, the possession of a complex nature—one or all, are incompatible with the true infinite and unconditioned, the reasoning is founded on the attempted exemplification of the infinite by the finite, and on the unessential accessories which the image presents. Logically expressed, it is a case of *fallacia accidentis*.

The antinomies of Kant and Hamilton. The antinomies of Kant and the essential contradictions of Hamilton, each of which seem necessary to the mind, and each of which exclude the other, are all made by the mind itself in the attempt to illustrate the infinite by the finite. The antinomies of Kant are incompatibilities between an *image* and a *relation* which the image exemplifies, or between two images adduced to illustrate different relations, or between two concepts which are not both necessary to the mind. The solution of them is to be found in a re-statement of the

conceptions between which these incompatibilities are said to exist. Thus, for example, in the alleged antinomy involved in the propositions *the world is in time and space and is neither finite nor infinite*; the contradiction lies between a fact or image borrowed from perception and experience and an alleged *a priori* necessity. But the incompatibility of the one with the other arises from a misconception of what is involved in our conception of the infinite, a confounding of the extended in space with space itself. When Hamilton says we must conceive of space as a bounded or not bounded sphere, he introduces the image of an object existing in space and limited in space, in order to illustrate space itself, and confounds the one with the other. To introduce the image of an extended object in order to show that space exists and holds some relation to every extended object is legitimate, but to substitute the limited, *i. e.* an extended object, for the true unlimited, *i. e.* the space which makes extension possible, and then to be embarrassed by the incompatibilities of our own creation, is to fall into the very serious error of confounding the *image* with the *notion* (the *Anschauung* with the *Begriff*), against which Hamilton expressly cautions his pupils.

§ 693. We observe still further, (*b.*) that the absolute, etc., though knowable, is not a notion that is the product of reasoning, *inductive* or *deductive*, or can be defined in a system of logical classification.

It cannot be inferred by induction, because, as has been shown, it is assumed in the very process of induction, as its necessary condition. Induction has no meaning and no validity, unless we assume that the universe is constituted in such a way as to presuppose an absolute and unconditioned originator of its forces and laws.

It cannot be deduced by syllogistic reasoning, because, as has been shown, all deduction rests either on the previous process of induction, or on the intuitions of time and space. But induction requires the absolute as its condition.

Nor can the concept be defined for the ends of logical classification. The infinite is not properly coördinate with the finite, for the reason that it must be assumed as the ground of all such classification. Every notion or concept of every finite existence implies the unconditioned, and holds some relation to it, but these relations are not therefore used in defining the notion for logical or scientific ends. The relations of substance and attribute, as used in such definition and classification, are applicable only to objects, which are dependent for their existence and their relations on the fixed conditions of finite being. They imply the presence of time and space relations, and the limitation of the powers of created beings by the laws which are determined by these relations. The cause and effect, the adaptations and ends, which logic usually recognizes in its operations, are fixed in a similar manner by settled forces and laws.

Again: the unconditioned and the absolute cannot be called a *summum genus*, under which are ranged the various ranks of the conditioned and the limited. It holds certain common relations to every species, but these relations are not generic. Space is not generic to all extended objects, though it is essential to the conception and reality of all. Time is not generic to enduring objects, though it is the condition of them all. God is not a mere *summum genus*—a highest abstraction, including all finite beings under itself—though He is the necessary ground of the existence of each and of all.

The so-called categories—*i. e.*, generic relations which are supreme and final in scientific definition and classification—cannot be applied to the infinite, because the infinite is required

and assumed for the explanation of these very categories. These categories rest upon the infinite, and presuppose it.

The absolute the
correlate of the
finite.

§ 694. We next affirm positively that the absolute is and can be known as the *correlate* which must be necessarily assumed to explain and account for the finite universe.

If the absolute is necessary to explain the finite, then it holds some relations to it. If it is its correlate, it must be connected with it by some relations. What these relations are, it is not needful to inquire. All that we need here to urge, is, that it is so far from being true, because it is absolute, it is not related, that, on the contrary, it cannot be the absolute without being known as related. We cannot know *that it is*, without knowing, to a certain degree, *what it is*. If it is necessary to the mind to assume the absolute in order to explain the finite, then the finite is certainly explained by these relations which it holds to the absolute. These relations must be real, else our knowledge is a fiction. They must be capable of expression in language. The relations between the finite and the infinite need not, of course, be the same as those which exist between the finite and the finite, but they must be real and cognizable relations.

Of course related
to the universe.

We have already shown that the categories required for scientific knowledge cannot be applied to the infinite, but it does not follow that there may not be other relations which may be applied to it. Whether these have not also some possible application to the finite, deserves a question. It would seem

that, if this were not the case, then the language which we apply to the finite could not, with any meaning, be applied to the infinite. Substance and attributes, the first as permanent under the fixed constitution of things, and the second as defining classes and species under this constitution, are not applicable to the self-existent originator of the finite; but *being* and *action* are applicable to both, though the concrete to which they are applied is, in the one case, far more full in import and superior in dignity than in the other. A self-existent being is a being as truly and far more eminently than a dependent being, but both are beings. He has powers no less really than the beings whose existence he not only originates, but whose capacities to act he imparts. *To originate, to produce, or to create*, are functions which are affirmable of one who originates his own existence and his very power to act, as truly as of one whose power to produce or to act is originated by another.

Relations do not
involve limita-
tion.

It is not philosophical to assert that, when we affirm a relation of the infinite, we must connect with it all those limitations which pertain to a similar relation in the finite. This would be the same as to say that there can be no

likeness where there is a difference, which is equivalent to asserting that there can be no generalization at all. We need not carry over to the infinite the misleading images which belong to the finite, nor the delusive associations which pertinaciously adhere to it; but to deny that there are relations which are common to the two, is to deny that we can know the infinite at all. To say, with Herbert Spencer, that we cannot believe in a Creator, because if we do, we must conceive of Him *as a carpenter*, working with tools and upon materials provided, and to dispose of the belief in creative energy, by the phrase, the *carpenter theory*, is to betray some ignorance of generalization, if not more serious defects in respect of both taste and fairness. Even an "indefinite consciousness" that the infinite is, must involve some knowledge of its relations.

§ 695. The apprehension of the absolute is *knowledge*, and
 The absolute ap-
 prehended by *not faith or feeling*.
 the intellect.

Hamilton opposes the one to the other, as faith to knowledge, because he affirms that to know is always "to condition;" and therefore if we know the unconditioned, we must condition the unconditioned, and limit the infinite. His doctrine is, that 'we believe the infinite, but do not know it to be. The sphere of our faith, is wider than the sphere of our knowledge.' But to know as related, is not the same as to condition in the special meaning in which the unconditioned and the infinite are opposed to the conditioned and the finite. The knowledge of the unconditioned may be *a priori*, intuitive, and necessary, but it is knowledge nevertheless. It may be higher than any reasoned or logically-defined knowledge, but it is still knowledge.

To call it faith, in any but a purely technical and private sense of the word, is to put it out of all relation to knowledge. To contrast it with knowledge in the essential characteristics of knowledge, is to weaken the very foundations on which both knowledge and science are made to rest. Especially is this the case, if this so-called faith is referred to an impotence of the intellect, and is made to depend on the conscious imbecility and known limitations of the powers. This is so far from being true, that, to know in this way, is to know in the highest sense possible to the mind. For if we cannot assume the infinite, we can neither define nor reason the finite. Without the intuition of the unconditioned, it is impossible to have any grounded science of the conditioned.

§ 696. But though we have a real and proper knowledge of
 Not known ex-
 haustively or
 adequately. the absolute, we can by no means have an adequate and ex-
 haustive, or what is often called an absolute knowledge of it.
 But this forms no objection to the reality of this knowledge. Indeed, an absolute knowledge, even of the finite, is only ideally conceivable, but, in fact, impossible. An absolute knowledge of all the relations of an individual object—*e. g.*, a mass of rock, a tree, an animal, or a man, implies a complete mastery of all the relations which each holds to every other object in the universe, in respect to its properties and ends—in other words, an exhaustive knowledge of the universe itself. The most sagacious and widely-reaching philosopher does not pretend to have attained such knowledge. He does not believe even, that the assembled knowledge of all the students of matter and spirit represents such a mastery over the knowable. He does not pretend to an exhaustive knowledge even of the *general* properties and laws which constitute and rule the universe. He knows, concerning this universe, that there is much that is knowable which is not yet known. How does he know this? Does the fact that it is ideally knowable, prove that it will be actually known? Does the fact that these relations are ideally finite prove that they will, in fact, ever be mastered by any finite intellect? If not, then, in the finite there is to man *the as yet unmastered and perhaps the unmasterable*; and that is to him *the infinite*.

The finite universe infinite to our knowledge. For man, the unexhausted finite must ever be as the infinite. But the fact that he knows the finite in part, is not inconsistent with the proposition that he knows it in truth. Nor ought the fact that he knows the infinite but in part, to be used to show that, so far as he knows it, he does not know it as it is. To man there is, in both finite and infinite, a background always unexplored. Perhaps in the finite it never can be explored by man. If so, then, even the finite is as the infinite to him. The limited forest, into the mazes of which the child has not yet penetrated, the shallow abyss the depths of which he has not ventured to sound, are to him the symbol of infinitude. So is the universe, finite though it be, as yet infinite to the philosopher, boast though he may of absolute knowledge, or reject though he will the possibility of an infinite which is placed forever beyond the mastery of every finite intellect.

Self-existence common to the finite and the infinite.

§ 697. In *both finite and infinite*, there is a common mystery, which *cannot be overcome*, and that is the *mystery of self-existence*. Whether we transform the finite into the so-called infinite, by making of its powers and capacities of self-development an ideal absolute without intelligence or personality, or whether we accept as the real absolute a rational person, either must be self-existent. It does not relieve the mystery, to accept the fact of self-evolved and self-evolving forces and laws; nor does it increase it, to accept the fact of a self-existent creating intelligence whom we assume to explain the order and thought of the finite universe.

Self-existence is as inexplicable *when it is* divided and diffused among the separate integers of a countless multitude of mutually developed and dependent forces, beings, and laws, as when it is gathered and centered into one thinking and acting person. Indeed, self-existence, and not personality or intelligence, constitutes the real mystery as it emphasizes the peculiar import of the absolute and the unconditioned. If, then, we must accept a self-existent absolute, if we know *that it is*, and can know in a degree *what it is*, the inquiry returns, What absolute must we assume, and on what grounds do we assume that it is? To this we reply:

The absolute a thinking agent. § 698. The absolute is a *thinking agent*. The universe is a *thought* as well as a *thing*. As fraught with design, it reveals thought as well as force. The thought includes the origination of the forces and their laws, as well as the combination and use of them. These thoughts must include the whole universe; it follows then that the universe is controlled by a single thought, or the thought of an individual thinker. If gravitation everywhere prevails, and gravitation is a thought as well as a thing, then the universe, so far as it depends on and is affected by gravitation, is a single thought. But a thought implies a thinking agent, and if the universe is a single thought, it was thought by one thinking agent. That this thinking person should be self-existent, is, as we have seen, no greater mystery than a self-existent thing.

Must be assumed to explain thought and science.

§ 699. We assume that this absolute exists, in order that thought and science may be possible. We do not demonstrate his being by deduction, because we must believe it in order to reason deductively. We do not infer it by induction, because induc

tion supposes it; but we show that every man who believes in either, or in both, must assume it, or give up his confidence in both these processes and their results. We do not demonstrate that God exists, but that *every man must assume that He is*. We analyze the several processes of knowledge into their underlying assumptions, and we find that the assumption which underlies them all is a self-existent intelligence, who not only can be known by man, but must be known by man in order that man may know any thing besides. In analyzing a psychological process, we develop and demonstrate a metaphysical truth, and that is the truth which the unsophisticated intellect of child and man requires and accepts, that there is a self-existent personal intelligence, on whom the universe depends for the beings and relations of which it consists. We are not alone justified, we are compelled to conclude our analysis of the human intellect with the assertion, that its various powers and processes suppose and assume that there is an uncreated thinker, whose thoughts can be interpreted by the human intellect which is made in His image.

But it may be asked, If there is an unconditioned person, what are space and time? Are these also infinite and unconditioned? If so, are there not three infinities, each independent of the other in certain relations, while each, in other respects, limits the other? If this be so, there is no single unconditioned, but time, space, and God taken together form the absolute when combined in one as mutually dependent. This, it might be urged, involves a sort of Pantheism, which is logical, if not material; a Pantheism which limits the thoughts and plans of God, if not His creative activity, by the fixed conditions of space and time.

We reply: Time and space are, as has been shown, not limited or finite, as are extended matter and enduring spirit. In so far, they are infinite in the sense explained. Moreover, they must be assumed as the correlates which *condition* the possibility of all finite and created being (§ 582); with respect to these they are themselves *unconditioned*. But we have shown (§ 689) that the proper unconditioned and absolute do not pertain to relations of quantity, though it may be described by them (§ 168), but that it describes absolute independence for existence and the power to act. We know too little of time and space to assert that, in any such relation, they are independent of God. They are used as the means of *measuring* His acts, of *regulating* the mightiest agents which He creates, and of *manifesting* many of His most comprehensive designs (§ 629). They are made the actual condition of finite being, in any and every form. We may say of time and space that they are as truly the thoughts of God, as the powers which they measure and control. If we cannot bring them under the categories of created being for the reasons already given (§ 585), we have no reason to ascribe to them self-existence, but may certainly know that whatever they are, they do *not* share in that independent self-existence which we ascribe to Him alone who is the living and true God.

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